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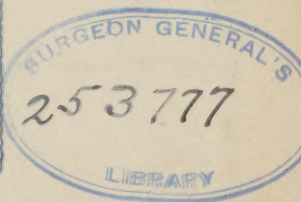
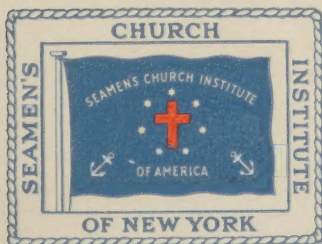
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MANUAL
ON
SHIP SANITATION
AND
FIRST-AID
FOR MERCHANT SEAMEN ✓

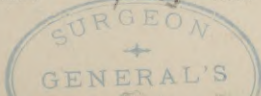
Prepared under the direction of the
Rev. ARCHIBALD R. MANSFIELD, D.D.
Superintendent, Seamen's Church Institute of New York
in co-operation with the
UNITED STATES PUBLIC HEALTH SERVICE
WASHINGTON, D. C.

BY
ROBERT W. HART ✓
Passed Assistant Surgeon



✓ SECOND EDITION—WITH ILLUSTRATIONS ✓

PUBLISHED BY THE
SEAMEN'S CHURCH INSTITUTE OF NEW YORK
25 SOUTH STREET [1923] NEW YORK, U. S. A.



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BROOKLYN, N. Y.

AUG -1 1923/

DEDICATED
TO
MERCHANT SEAMEN

MEDICAL ADVICE FOR SHIPS

Through the efforts of the Seamen's Church Institute of New York and in cooperation with the U. S. Public Health Service, the Radio Corporation of America undertook to furnish, without any charge whatever, free medical advice to sick or injured persons on ships.

During the first year that this arrangement was in effect, calls for medical advice came so frequently from ships that it was readily seen the service was of considerable value. Therefore, free medical advice has been extended to vessels under ALL FLAGS through other radio stations located in the United States and Central America.

The radio stations which are, at all times, ready to furnish medical advice are as follows:

Chatham, Mass.	WIM
Chatham, Mass.	WCC
New York, N. Y.	WNY
Cape May, N. J.	WCY
San Francisco, Calif.	KPH
Los Angeles, Calif.	KSE
Algiers, La.	NAT
New Orleans, La.	WNU
Burwood, La.	WBW
Fort Alabama.	WIO
Swan Island, Caribbean Sea.	US
Tela, Honduras.	UC
Puerto Castills, Honduras.	UA
Tegucigalpa, Honduras.	UG

Port Limon, Costa Rica.....	UX
Almirante, Panama	UB
Santa Marta, Colombia.....	UJ

In addition to the above-mentioned radio coastal stations providing medical advice, all passenger ships of the United Fruit Company furnish a similar service.

Vessels desiring medical advice can secure same promptly by forwarding radiograms to any of the above-mentioned stations or ships with which communication is established. Such radiograms should be signed by the Master and should briefly, but clearly, state the symptoms of the afflicted person.

The medical advice will be phrased in language intelligible to a layman.

It is requested that when sending radiograms pertaining to medical advice, radio operators indicate the number of words in the message and use the PREFIX "DH".

Medical radiograms will be given preference, by the Radio Corporation of America and United Fruit Company stations, over all other radiograms excepting distress calls.

There is NO CHARGE whatever for medical advice for ships nor for the radio service in connection therewith.

Medical advice, FREE OF CHARGE, may also be obtained by vessels of any nationality, through BERGEN RADIO, NORWAY, and GOTEBOG RADIO, SWEDEN. Requests for such advice may be made in the Norwegian, Danish, Swedish, German, English or French language.

NOTE TO THE SECOND EDITION

This is the Second Edition of the Manual on Ship Sanitation and First-Aid for Merchant Seamen.

The Manual has most satisfactorily accomplished its purpose in helping to meet one of the greatest humanitarian needs on board our Merchant Vessels.

In the present edition important revisions and additions have been made by the Author with the helpful cooperation of Surgeon Claude H. Lavinder of the United States Public Health Service and Doctor Warren L. Duffield.

July, 1923.

TREASURY DEPARTMENT
UNITED STATES PUBLIC HEALTH SERVICE
OFFICE OF THE SURGEON GENERAL
Washington, D. C.

I COMPLY very gladly with the request for a short foreword for this manual. It has been prepared especially to meet the need of seafaring men and I commend not only the purpose of the book, but also its contents.

It seems to me at this time peculiarly appropriate to direct attention to the connection which, by law, exists between Masters and men of the Merchant Marine and the Public Health Service, which is the Federal agency charged with definite responsibilities in matters affecting their health and quarantine of vessels operated by them. The promotion of a spirit of mutual trust and good will between the American Merchant Marine and the Public Health Service is a matter of vital importance which concerns the entire nation.

It is my earnest desire to foster in every way possible the most cordial co-operation in this association. This manual, in its way, supplies the basis for a more intelligent relationship of this kind. It furnishes to Masters and others valuable information which, if rightly used, would do much to increase the efficiency of personnel by maintaining good health. It also gives counsel, which, if followed with judgment, would greatly help to obviate delays at quarantine.

Under a recent ruling of the Board of Supervising Inspectors approved by the Secretary of Commerce, original licenses to Masters, Mates, Pilots or Engineers will not be granted until they have been examined in first-aid by the Public Health Service. For the present, at least, this book will be used for such

instruction, and the examination will be based upon its contents.

I could not conclude without at least a word of admiration for the Seamen's Church Institute of New York and the excellent and unique service rendered by that organization to seamen of all nationalities. It gives me pleasure to think that the issuance of this little book is in some manner an additional indication of the spirit of good fellowship which exists between Dr. Mansfield and myself in our effort to promote the welfare of the Merchant Marine.

H. S. CUMMING,
SURGEON GENERAL,
U. S. Public Health Service.

WASHINGTON, D. C.
November, 1921.

PREFACE

THIS manual is prepared with the following purpose in mind: To furnish officers and men of the Merchant Marine with a small, comprehensive text-book on general ship sanitation and hygiene, containing an outline of the common medical and surgical conditions that obtain on shipboard together with directions for the treatment of diseases and also for the proper care of injuries.

Something more than directions for first aid is necessary for use on board a ship where on long voyages it may be several weeks before a doctor can be seen. An attempt has been made, therefore, to include some practical information concerning bedside nursing, the use of simple remedies and instructions which will enable a layman to meet those terrible conditions which sometimes follow serious accidents at sea. For this reason certain items of instruction are added which are usually omitted from books designed for the use of those happily situated in places not so greatly removed from the habitations of men.

The language and terms used are as simple as possible, so that those for whom the manual is intended may find it easy to understand.

Sanitary conditions on shipboard are not all that they should or could be, due not so much to wilfulness as to ignorance regarding even the most elementary rules of sanitation and hygiene and their relation to health. Seamen admitted to hospital from shipboard are often found to be suffering unnecessarily because of neglect or for lack of simple treatment. Reference is made not to "liners" and larger vessels that have a medical officer on board but to those that do not carry a ship's doctor and have no facilities for the care of the sick or injured.

From an economic standpoint, it is highly desirable that the sanitary conditions aboard our ships be improved. Owing to lack of ordinary precautions, vessels are often obliged to run lighthanded because members of the crew are laid up with illness, which might have been avoided by simple medical treatment or some degree of sanitary knowledge. Then, too, due to

poorly directed treatment, not infrequently, an injury received out of port results in a longer term of disability than necessary with possible consequent damage suit against the owners. A knowledge of *first aid* and its application to an early treatment of such cases might prevent weeks and months in the hospital for the seamen and save dollars to the owners.

Because of these conditions, the Secretary of Commerce has approved the Amendment to Rule V, Section I of the General Rules and Regulations prescribed by the Board of Supervising Inspectors, that no candidate for original license as master, mate, pilot or engineer shall be examined unless he shall present satisfactory evidence to the inspectors that he has completed a course of instruction in the principles of *first aid* approved by the United States Public Health Service, duly attested; that he has passed a satisfactory oral examination based upon the contents of the "Handbook of the Ship's Medicine Chest" or some other manual arranged for the purpose, having the approval of the United States Public Health Service.

The Public Health Service has, therefore, arranged to give a course of instruction in *Ship Sanitation* and *First Aid*, followed by an *oral* examination.

Instruction and examination will be given in those places where licenses for master, mate, pilot or engineer are usually issued, with some exceptions. For full information application should be made to the United States Steamboat Inspection Service, Department of Commerce, Washington, D. C.

It is earnestly hoped that this *manual* will accomplish its purpose and eventually help to improve the present unsatisfactory conditions.

ROBERT WILLIAM HART.

November, 1921.

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SANITATION IS THE ESTABLISHMENT OF
CONDITIONS FAVORABLE TO HEALTH

HYGIENE IS THE SCIENCE OF HEALTH AND
ITS PRESERVATION

MANUAL ON SHIP SANITATION AND FIRST-AID

PART I

GENERAL SANITATION AND HYGIENE ESPECIALLY AS RELATED TO CONDITIONS ON SHIPBOARD

Cause of Disease

Most diseases are caused by the growth and activities of certain minute living particles, called germs. There are germs everywhere in nature. Some of them, when taken into the body, produce disease, while others so taken have no ill effect. Germs may be introduced into the body in various ways. By swallowing, by breathing them in, by their being injected into the body by the bite of an insect, such as the mosquito or louse, or they may be introduced into the body through wounds. Very often, the introduction of the germs themselves does not cause illness, but these tiny living particles produce poisons, which when circulated in the body, cause disease.

Other diseases are caused by the lack of observance of the ordinary rules of correct living; otherwise known as hygiene. For instance, if an individual eats some indigestible substance, this will in all probability bring on a pain in his belly; if he fails to keep his body clean, he may become infested with lice or other vermin which may, in biting, introduce the germs necessary to produce illness.

CONDITIONS AFFECTING HEALTH

The observance of certain simple rules is necessary to keep the body healthy and in condition to resist disease. Keep clean inside and out; use only pure water and pure food. Get plenty of fresh air. Take enough exercise. Be moderate in the matter of eating and drinking. Wear suitable clothing.

Avoid Quack Doctors

A quack doctor or a doctor who advertises is to be avoided. He is a medical outlaw who is shunned by reputable physicians and should not be trusted by an intelligent man or woman to treat diseases. He usually attempts to frighten the patient into believing that he is threatened with some serious disease which can be cured only by some peculiar method or wonderful drug. The prices charged are higher than those of a regular doctor and the patient is often fleeced and then cast out. Doctors who advertise to cure rupture, piles "lost manhood," venereal diseases, etc., should especially be avoided. There is no useful drug or treatment known to the quacks which is not known also to regular physicians.

Patent Medicines Harmful

Seamen are entitled to free medical treatment by the Government, which furnishes physicians and medicines in nearly every large port of the United States. Patent medicines are made to sell. Some of them are harmful and contain habit-forming drugs. Many of them are merely purgatives and others have no medical properties of any kind. Most diseases require different kinds of medicine in different individuals. Besides this, a cure often depends upon many things other than medicine. If sick or worried about himself, a man should see a reputable physician, follow his advice in all things and take only medicines prescribed by him.

Inspection of Crew before Sailing

Just before putting to sea the crew should be mustered and inspected for illness. Any man who appears sick with severe cough, fever, diarrhœa, vomiting, chills or cramps should be sent to hospital or at least put ashore. A man with severe rheumatism, pain in the chest, inflamed eyes, painful ear or with acute venereal disease may become not only utterly useless within a few hours or a few days after leaving port, but he may also require one or two well men to care for him while sick. It is not fair either to the sick man or to the other members of the crew to put to sea under such conditions. Just as the ship itself is overhauled for defects so the crew should be known to be "able-bodied" in every sense of the word before the ship weighs anchor or casts off a line. Men will be examined at any relief station of the Public Health Service free of charge to ascertain whether they are fit for the voyage. (See list of relief stations on page 164.)

Cleanliness

By cleanliness is meant frequent bathing with subsequent change of clothes, especially underclothes, careful washing of the hands before eating, especially after the handling of dirty substances or articles which might carry the germs of disease, or after going to the toilet; care of the hair and beard and careful cleansing of the teeth with a brush, which latter should be done at least once a day, preferably more often.

Bathing Facilities

The installation of bathing facilities is simple, and each vessel should have a heated place fitted up for bathing. It is not necessary to install bath tubs or an elaborate bath arrangement. A small cubicle or cuddy, opening on the crews' quarters and having hot and cold-waterpipes run into it, with an arrangement for a shower bath, is certainly not too much to expect of steam vessels, and even on windjammers care should be taken to make some satisfactory arrangements in this important matter. The

galley should be required at all times to furnish sufficient hot water for bathing and the necessary vessels provided. A protected place on board ship should be specifically designated, where the crew may be made as comfortable as possible in the performance of this very necessary duty. The old system of bathing on a cold steel deck in icy salt water was not conducive to personal cleanliness. Fortunately, most of the newer steam vessels have been built with a warmed bath house.

Mouth Hygiene and Care of the Teeth

Seamen, as a whole, do not take even moderately good care of their teeth. It is rather unusual to see a good set of teeth in a seaman past thirty-five, and many of them are suffering from undernourishment, the effect of not having sufficient teeth to properly chew their food. A tooth brush used daily once or more times will save many teeth that otherwise would be lost, while a little cleaning and dental work while in port would save many a set of teeth. Each man should go to a dentist at least once a year and have his teeth gone over; have them scraped and cleaned thoroughly and have all cavities filled. Many teeth, even with large cavities, can be saved by careful filling, and properly filled teeth are more satisfactory than either bridge work or plates. Pyorrhea and shrinking of the gums with exposure of the roots of the teeth, is largely due to neglect of the mouth. The application, along the gum line, of a little tincture of iodine occasionally, the brushing of the teeth with a few drops of tincture of myrrh sprinkled on the tooth brush and a thorough cleansing of the teeth when in port, will aid in the prevention of pyorrhea. Old snags of teeth, especially those with sharp edges, which are irritating the tongue or cheek, should be pulled, as quite frequently, through irritation, they cause the growth of a cancer on the tongue, lip or cheek.

Clean Clothes

The clothing, especially the underclothing, should be changed frequently. In case vermin get on the clothes, they should

be killed either by flowing steam or steam under pressure, or by fumigation by means of sulphur gas.

Beds and Bedding

Beds and bedding should be cleaned at regular intervals. This cleaning should be done under the supervision of one of the ship's officers. Blankets, mattresses and pillows should be carried on deck, thoroughly beaten and exposed to the sunlight at regular intervals, the weather permitting.

Getting Rid of Vermin

If one of the members of the crew is infested with lice, these may spread to all the occupants of the forecabin, unless immediate steps are taken to prevent it. In the detection of lice the seams of the clothes, especially the underclothes, should be carefully examined since lice and nits will often be found in the seams of the clothes when none can be found on the body of the individual. The lousy individual should have his hair and beard cut short and the parts harboring the lice should be thoroughly washed in a mixture of coal oil and soft soap or gasoline and soft soap. A good delousing soap mixture consists of

Chip soap	1 part
Gasoline	4 parts
Water	3 parts

Mix together thoroughly and use as soft soap, especially on hairy parts of the body. His clothes should be treated by boiling, flowing steam, steam under pressure, soaking in gasoline, or, if necessary, burned or thrown overboard. The same procedure should be carried out in relation to his bed and bedding. It may be necessary to treat the clothes more than once to get rid of lice, as the eggs may not all be killed by the first fumigation and another treatment may be necessary after these hatch.

Fumigation by Sulphur

If the quarters have become infested with vermin, these can usually be gotten rid of by sealing the room carefully and burn-

ing in the quarters, three pounds of roll sulphur for each 1000 cubic feet of air space for 6 hours. The sulphur is best burned in shallow iron ovens, so-called "Dutch ovens." The sulphur should be powdered, alcohol poured over it and then lighted. Care must be taken to prevent damage to the cargo or vessel by fire. If disinfection of the quarters is practised following acute infectious disease, the amount of sulphur should be increased; namely, five pounds to each 1000 cubic feet of air space for 12 hours. In fumigating quarters for vermin, the same procedure holds as in the case of clothes, i.e., refumigation may be necessary after the eggs hatch. (See p. 40.)

Cause of Disease in Seamen

Fortunately, among seamen as a class, bodily cleanliness is probably more common than in any other class of men on earth. Many of the conditions leading to disease are due to the close association necessary on board ship.

Care of the Bowels

Inside cleanliness consists of seeing that the bowels move freely at least once a day, since most of the poisons formed in the body are gotten rid of through the bowel. The bowel can be trained to empty itself at some given time if sufficient attention is paid to the matter. If necessary, an occasional mild cathartic should be taken, although continued use of cathartics will eventually so injure the sensitiveness of the bowel that there will be no action without a cathartic. If necessary, an injection of a small amount of warm water (with or without soap suds) into the rectum will bring about a bowel movement.

Toilets

In this connection, attention should be directed to seeing that sufficient toilets are provided and that they are kept clean. Certainly, a filthy toilet will not stimulate a person to remain long enough to properly empty the bowel. Toilets should be

thoroughly scrubbed daily and this scrubbing should include seats, hoppers, urinal troughs, floors and walls. If this scrubbing process is thoroughly carried out, there will be little necessity for the use of chloride of lime and similar substances in the toilets.

Light and Ventilation

Fresh air and light are necessary for health. Ventilators should be so arranged that there is a constant flow of fresh air through all parts of the vessel, especially through the quarters. Proper ventilation; namely, a constant flow of pure air, will do much to prevent the spread of tuberculosis and other diseases aboard ship. Quarters should be sufficiently well heated that, even with a constant flow of fresh air, they will be comfortable. The same rules hold true aboard vessels of the merchant marine, as in the Navy, regarding the necessity for light and ventilation. The A-B-C's of ships' sanitation in the Navy are sunlight, physical cleanliness and plenty of air. Quarters should be well lighted and a great deal of attention paid to ordinary physical cleanliness. Unless daily inspection of quarters is made, it can hardly be expected that they will be kept in good order, but this should be just as much a part of the duty of the ship's officers as navigation, since the welfare of the crew is of great importance. It will hardly be necessary to take up the matter of ventilation in any detail since all seamen of the merchant marine are well acquainted with the use of ventilators, windsails, etc.

Airing of Bedding

The necessity for airing bedding, the fumigation of beds and bedding and the cleaning up of quarters for the crew, together with a liberal allowance of fresh air, cannot be too strongly over-rated. It should be made a rule on each pleasant day that the beds and bedding be taken from the quarters and placed on deck where they can be well aired.

Clean Drinking Water

The necessity for good drinking water on shipboard is generally recognized and the water supply taken on in ports of the United States is usually pretty good. However, it occasionally happens that a ship takes on fresh water for drinking purposes, at an out of the way port, and it may be that at the same time she takes on cholera or typhoid germs, together with the fresh water. Unless the water supply is above suspicion, the water for drinking purposes should either be distilled, boiled, or disinfected by chemicals in the tanks before it is used. Infected or doubtful water can be made safe for drinking purposes by boiling for at least five minutes and then cooling.

Disinfection of Drinking Water by Calcium Hypochlorite

Disinfection of moderately clean water by chemicals is done quite readily by adding calcium hypochlorite (chloride of lime); also sometimes called bleaching powder, 15 grains (1 gram), to each barrel of water. Chloride of lime (calcium hypochlorite) should be carried as part of the medical supplies. This can be secured from almost any drug house in convenient form such as 15 grain (1 gram) tablets. One of these tablets, for each barrel of water, is crushed, made into a paste in a tablespoonful of water and added to the water to be disinfected. After one-half hour, the water should be safe for drinking purposes. In this amount, it gives the water practically no taste and is absolutely harmless. If calcium hypochlorite tablets are not available, the water can be disinfected safely by using ordinary bleaching powder or chloride of lime, $\frac{1}{4}$ level teaspoonful to the barrel of water. If in doubt as to the safety of the water use more lime. Although the taste may be disagreeable if added in excess, this substance in reasonable quantities is harmless. The lime should be taken from a freshly opened can. This is used in the same way as in the case of the tablets. As chloride of lime (calcium hypochlorite) soon loses its strength it is recommended that the old stock be thrown out at the end of each six months and a fresh supply secured.

If chloride of lime is not available, drinking water may be disinfected by adding one *tablespoonful* of standard tincture iodine to one barrel of water (approximately 55 to 60 gallons), stirring and allowing it to stand for a half hour before using. The first method is better.

Still

Practically all the new ships are equipped with stills for the preparation of pure water from sea water. Distilled water is the purest form of water and is always safe for drinking unless it has been stored in dirty containers. The use of distilled water is strongly advised where possible and practicable.

Filters

Manufacturers of commercial filters maintain that their filters will always produce a pure water fit for drinking purposes. This is not always true, as many of the commercial filters are not reliable and in fact may do positive harm, although if it is used only to clarify water, and the water is afterward treated with bleaching powder, the filter may serve a useful purpose.

Foods

There was a day, fortunately, now almost passed, when it was considered an economy to furnish for the use of the crew the poorest grade of food that could be bought. The rules laid down by the Department of Commerce (see appendix), for the rationing of American ships, if observed, will furnish a fairly well balanced and satisfactory ration, provided the quality is good. Of course, if the skipper or his steward become too economical in the matter of quality, in their buying, even with the present ration allowance, poor food may still obtain, but this condition is becoming more and more rare. Without ice or without an ice making plant, it is practically impossible to keep fresh meats more than three or four days and attempts to do so will only result in illness.

Scurvy

It is hardly necessary to bring up the subject of scurvy in the present day, but for the sake of the few who need this advice, scurvy is a disease caused by the eating of food usually salty or dried, for a considerable period of time, without the addition of fresh vegetables or meat. Even on a long voyage its prevention is comparatively simple if the Department of Commerce regulations (see appendix) are followed and fresh bottled lime or lemon juice is carried and dispensed to the crew at regular intervals and in given quantities. Tomatoes, either fresh or canned, are especially valuable in the prevention of this disease. Vinegar, sweetened with sugar, is also useful as a preventive and should be dispensed to the crew in the same way.

Method of Using Antiscorbutics

Not more than ten days after it is necessary to use largely salty food in feeding the crew, lime or lemon juice should be served to each man, one-half ounce per day, and vinegar and sugar one-half pint per week. These substances must be used as long as it is necessary to feed the crew largely on salty foods. (Any sort of fresh fruits or fresh vegetables will prevent scurvy. Tomatoes are especially rich in those substances which prevent scurvy. These substances remain present even in cooked and canned tomatoes. In the present day this disease usually is an indication of carelessness and neglect on the part of the owners and officers.)

Suitable Clothing

It is a matter of consequence that the body be properly protected. The clothing should not fit so closely as to prevent free bodily movement, and it should be of material appropriate to the season and the weather conditions. The body needs to be kept warm and dry.

If sickness is to be avoided and efficiency maintained, the Master should require every man on board to have an adequate supply of proper clothing.



FIG. 1.—Proper method of placing rat guards on mooring lines.

CERTAIN DISEASES OF SANITARY SIGNIFICANCE ON SHIPBOARD

There are certain diseases and conditions which may be found on shipboard, to be taken up in detail in a later chapter, but which are mentioned at this time in order to point out their significance from a sanitary standpoint. Among these may be included plague, yellow fever, typhus, malaria, smallpox, cholera, typhoid and venereal diseases.

Prevention of Plague

Bubonic plague is a disease transmitted by means of the bite of the flea which infests the rat. The flea becomes infected from feeding on a rat which has plague, and upon the death of the rat will attack man, and through its bite transmit plague. As all ships are more or less infested with rats, the control of plague depends on the control of the rat population. Every precaution should be taken to see that rats and mice do not get aboard ship, and every effort should be made to rid the ship of those already aboard. Rat guards, consisting of inverted cones or disks of metal, not less than three feet in diameter and so fixed as to be at right angles to the lines to which they are attached, should be placed on all lines leading to the dock when the boat is in harbor. (See Figure 1 for proper method of using rat guards.)

Articles that harbor, or are liable to harbor rats, should not be shipped until freed of such vermin. Special precautions should be taken to prevent rats from getting aboard when the cargo consists of grain or other food stuffs. All vessels engaged in trade with foreign ports must be fumigated not less than once in every six months for the purpose of destroying rats. Fumigation, done by the quarantine officer, is usually by means of cyanide gas. It might be necessary or advisable for the master of a vessel which had become infected to fumigate her himself, if at some out of the way port where cyanide fumigation could not be done. In this case, the proper method would be by means of

sulphur gas. For the killing of rats, mice and vermin of that kind, sulphur should be burned in the proportion of three pounds to each 1000 cubic feet of air space. The compartment should be exposed to the gas for at least six hours. The sulphur should be fired, preferably in iron ovens, using not more than ten pounds of sulphur to each oven. If the vessel is loaded, the time should be doubled. (See method of fumigation for vermin, p. 17.) Of course, it is assumed that should plague break out on a vessel, she will immediately make for the nearest quarantine station where she can be fumigated, and where proper medical treatment can be given.

Prevention of Yellow Fever

Yellow fever is a disease common in certain warm climates, more especially in parts of Mexico, Central and South America. It is caused by the bite of a certain kind of mosquito called the *Stegomyia*, which has fed on some person sick with yellow fever. This disease is more common to cities and large ports than to small ports, as this mosquito is a city mosquito and is not found to any great extent in the country. Where yellow fever is known to prevail, it is often times advantageous to berth the ship out in the channel, 200 yards or more away from the shore and the immediate source of the mosquitoes, and fumigate her, to get rid of them. Careful screening of cabins and quarters should also be carried out. The fumigation for mosquitoes is carried out much after the manner of fumigation for rats and vermin of this type. It is advisable at ports where yellow fever prevails to take precautions to prevent the breeding of mosquitoes in water tanks, buckets and other collections of standing fresh water about the vessel. All water containers should be carefully screened with a fine mesh mosquito screen to prevent access of mosquitoes. In case some one on the vessel develops yellow fever, he should be very carefully screened to prevent the access of mosquitoes, as the disease can only be spread through the bite of this insect.

Prevention of Typhus

Typhus fever also known as ship fever and prison fever is a disease similar in many ways to typhoid but is carried from person to person by the bite of the louse. The louse having fed on some one sick of the disease becomes infected and may transmit the disease by biting some one else. For this reason every precaution must be taken to free both passengers and crew of lice. (See method of getting rid of vermin, page 17.) On account of the danger of typhus from certain parts of Europe, the U. S. Quarantine authorities delouse all persons entering the United States from infected places. In case typhus should break out on board, in addition to delousing the passengers and crew all baggage (dunnage) should be fumigated and the quarters also fumigated to kill lice and other vermin.

Prevention of Malaria

Malaria is transmitted in the same way as yellow fever, but by the bite of a different kind of mosquito, the Anopheles, which is essentially a country mosquito. This disease is fearfully prevalent in certain ports and certain parts of the world, notably Tampico, parts of the Mexican coast, the Gold Coast, and Sierra Leone. The same precautions taken in killing yellow fever mosquitoes, will rid the ship of malaria mosquitoes. Malaria usually follows shore leave, during which time the person is bitten by a mosquito carrying the disease. While in a port or locality where malaria is known to be common, each person should take ten grains of quinine sulphate once a day. If this is done regularly, it will prevent the development of this disease. If preferred, the quinine can be taken in smaller doses; $2\frac{1}{2}$ or 3 grains three times a day at meal times, in place of a single dose.

Prevention of Smallpox

Smallpox is a very acute and very contagious disease which spreads by direct contact from person to person. It is a disease which can be absolutely prevented, however, by vaccination.

If an outbreak of smallpox occurs aboard a vessel, the patient should be immediately isolated from the rest of the crew and every one on board ship promptly vaccinated.

Method of Vaccination

A brief description of the proper method of vaccination is given here, in order that ship's officers may vaccinate members of the crew if no medical assistance is available. The vaccine purchased is usually in small glass tubes. Using a clean needle the point of which has been passed through a flame to sterilize it, the skin over the outside of the upper arm is scratched either in two parallel lines in the following way or a small circular area is scratched on the skin. Before these scratches are made, this part of the arm should be carefully cleansed either with soap and water or by scrubbing with a piece of cloth wet with alcohol.

The scratches should not be deep enough to draw blood, but should be deep enough to cause a light straw colored serum to ooze out of the skin. After the scratches are made, a little of the vaccine (material in the glass tube), is forced out of the tube into the scratches where it is allowed to dry. No other treatment is necessary.

About five days after the vaccination, if there is a "take," the skin over this area gets red and there is a little swelling. This swelling continues to increase in size until finally there is a blister filled with clear fluid which forms along the line of the scratches. The water in these blisters later turns to pus. At this time there is very often some swelling of the glands in the arm pit and the arm is sometimes pretty sore for a few days. Eventually, this pus dries and a scab forms, which falls off in about three weeks, leaving the typical vaccination scar.

Prevention of Cholera

Asiatic cholera occurs at times on shipboard. Cholera is present in certain ports and parts of the world at nearly all times. The disease is usually transmitted by swallowing the

germs of cholera, either in food or water. Where the ship's water supply is taken from rivers or other sources which may contain cholera germs and the water is not sterilized, there is always a chance of members of the crew developing cholera. In the same way, vegetables or fresh fruits, washed in water containing cholera germs, may give rise to the disease, as may also the handling of food in its preparation by cholera carriers (those who have had cholera, recovered, but continue to discharge cholera germs in their urine or stool). Consequently, it is necessary to sterilize all water which may possibly be infected with cholera. Fresh-water supplies, taken from rivers or wells, in ports where this disease is present, should be boiled or should be sterilized by means of chemicals before being used, and the food taken on at these ports, especially green vegetables and fruits, should be cooked before being eaten.

Prevention of Typhoid

Typhoid is a disease transmitted in the same way as cholera, but is more common in cooler climates than in the warmer zones where cholera is usually found. The presence of either of these diseases is an indication of filth, and means that the urine or stool of someone having the disease has come in contact with the food or drink of the individual developing the disease. The same precautions in the matter of food and drink that are to be taken in the case of cholera, will serve to do away with the danger of typhoid.

Within recent years, there has been developed a method of vaccination against typhoid. This method gave excellent results during the World War. Any individual applying to a station of the U. S. Public Health Service will be vaccinated against typhoid fever free of charge.

Prevention of Venereal Diseases

There are three common types of venereal disease. These are gonorrhea, syphilis and chancre. These diseases are

nearly always contracted through sexual intercourse. The only safe method of prevention is to stay away from loose women, who are found in almost every port. It is recognized, however, that all the good advice given will not always prevent seamen, coming ashore after a long voyage, from indulging themselves sexually. After all, the problem of the prevention of venereal disease comes down to a problem of cleanliness. If, immediately following intercourse, the parts are thoroughly washed in soap and warm water, an injection of one-half ounce of 20 per cent watery solution of argyrol, or 2 per cent. solution of protargol used, and after this the parts are thoroughly rubbed with 30 per cent. calomel ointment for a period of five minutes, very few cases of venereal disease will develop.

Gonorrhea or "Clap"

Gonorrhea or "clap" is a disease consisting of a discharge of pus from the water passage, together with certain complications. The danger on shipboard is that of having some of this discharge get on roller towels or sweat rags and so in this way get into the eyes of persons using these towels or sweat rags. The germs which cause gonorrhea will grow in the eye and cause a very severe inflammation, with swelling of the lids, a discharge of pus, and unless promptly treated, blindness. The prevention of this condition consists in having facilities where the crew may wash their hands after soiling with this discharge.

Syphilis

Syphilis, sometimes called "hard chancre," is a venereal disease which consists in the early or first stage of a simple ulcer or sore, more or less hard, which may be located anywhere, but usually appears on the genital organs. During the first and second stage, the disease is most dangerous to others. During the second stage, there is a breaking out on the skin and mucous membranes, especially in the mouth. Any person having this

syphilitic sore mouth, using knives, forks, cups, or other eating or drinking utensils, may infect the utensil, and another using the utensil after him is liable to develop the disease. In this case, they in turn may develop a primary sore or the first stage of the disease, on the lip, tongue or tonsil. Any member of the crew having a breaking out on his body, together with a sore mouth should be carefully watched to see that he uses only his own eating utensils, towel, etc., and keeps them separate from those of others. As a word of warning, men who have had syphilis should not consider themselves cured merely because they have no further breaking out on their bodies or in their mouths. Syphilis is a long drawn out, chronic disease, which requires anywhere from one to three years of treatment to cure, and even then this cure is not certain, and it will be necessary for the man to report to a physician at least once a year for the next several years in order that he may have his blood tested and take further treatment if necessary.

MARITIME QUARANTINE

Quarantine rules and regulations are familiar to most seafaring men, especially officers, so that a mere outline of them will be given in this work, together with the reasons for them.

Quarantine is maintained at all ports of entry, both in this country and others, against ships coming to the country from a foreign port. This quarantine is maintained by Government officials for the purpose of keeping out of the country diseases which may be brought by those aboard ship or by animals or insects carried on the ship, from the ports of clearance or of call, to their port of entry.

Quarantinable Diseases

In the United States, quarantine is maintained against plague, smallpox, leprosy, yellow fever, typhus, cholera and anthrax. While the quarantine regulations differ somewhat in different countries, they are similar in nature and strive to exclude the most dangerous contagious diseases.

Bills of Health

Among the clearance papers necessary for a vessel bound from a foreign port to a port of the United States is the "Consular Bill of Health" which shows the prevalence and varieties of diseases occurring in the ports of clearance. If this bill of health shows an unusual amount of any quarantinable disease, special care is taken at the port of entry to see that none of these diseases is brought into the country by passengers or crew, and if the disease may be carried by an insect or animal the ship is quarantined and fumigated to rid her of the insect or animal carrier of the disease.

Under the quarantine regulations of the United States it is required that a vessel obtain a bill of health from her port of departure and a bill of health from each port of call. The form of the bill of health, as prescribed by regulation, is given below. These bills of health are very important papers and convey information which may determine the quarantine status of a vessel upon her arrival at a port of entry in the United States.

UNITED STATES OF AMERICA

Bill of Health

I, (the person authorized to issue the bill, at the port of) do hereby state that the vessel hereinafter named clears (or leaves) from the port of under the following circumstances:

Name of vessel
 Nationality Master
 Tonnage, gross Net
 Name of Medical Officer Number of Officers
 Of crew, including Petty Officers
 Officers' families Passengers destined for the United States
 First cabin Second cabin
 Steerage Ports visited within preceding four months

Location of vessel while in port: Wharf.....
Open bay.....Distance from shore.....
If any passenger or member of crew disembarked on account of
sickness, state disease.....
Time vessel was in port.....
Character of communication with shore.....
Sanitary condition of vessel.....
Sanitary measures, if any, adopted while in port.....
.....
Sanitary condition of port and vicinity.....
Prevailing diseases at port and vicinity.....
Number of cases and deaths from the following named diseases dur-
ing the past two weeks ending.....
.....

Diseases	Number of Cases	Number of Deaths *	REMARKS
			(Any conditions affecting the public health existing in the port of departure or vicinity to be here stated)
Yellow fever...	
Asiatic Cholera..	
Cholera Nostras or Cholerina..	
Smallpox.....	
Typhus Fever..	
Plague.....	
Leprosy.....	

* When there are no cases of deaths, entry to that effect must be made.

Date of last case (within preceding year).

Cholera.....
Yellow fever.....
Human plague.....
Typhus.....
Rodent plague.....

I certify that the vessel has complied with the Quarantine Rules and Regulations made under the act of February 15, 1893, and that the vessel leaves this port bound for.....
 United States of America, via.....

Given under my hand and seal this.....day
 of.....19.....

(Signature of Consular Officer).....

(Seal)

Countersigned by:

ABSTRACTS OF QUARANTINE LAWS AND REGULATIONS OF THE UNITED STATES

Some knowledge of the quarantine laws and regulations of the United States is of very essential importance to the Masters of all vessels. Brief abstracts of the more important features of these laws and regulations are given here.

The bill of health will not be issued until the officer issuing the bill of health has satisfied himself that the vessel, passengers, crew and cargo have complied with all the quarantine laws and regulations of the United States.

Vessels before storing cargo or receiving passengers should be mechanically cleaned in all parts, especially the hold, forecastle, and steerage, and loose dunnage in unladen compartments shall be so arranged as to prevent the harborage of rats.

All articles suspected of being infected shall be disinfected before shipment. No person suffering from any communicable disease or any acute infectious disease should be allowed to board the ship.

General Regulations at Sea

The master of a vessel should observe the following measures on board his vessel:

The water closets, forecastle, bilges, and similar portions of the vessel liable to harbor infection should be frequently cleansed and disinfected.

Free ventilation and rigorous cleanliness should be maintained

in all portions of the ship during the voyage and measures taken to destroy rats, mice, fleas, flies, lice, mosquitoes and all vermin.

A patient sick of a communicable disease should be isolated and one member of the crew detailed for his care and comfort, who, if practicable, should be immune from the disease.

There should be as little communication as possible between the patient or his nurse and other persons aboard the ship.

Clothing, body linen and bedding of the patient should be immersed at once in boiling water or in a disinfecting solution.

After the removal of a patient from a compartment, this compartment should be thoroughly cleaned and disinfected.

Any person suffering from malaria or yellow fever should be kept under mosquito bars and the compartment in which he is confined closely screened with mosquito netting. All mosquitos on board should be destroyed by fumigation. Mosquito larvæ (wigglers or wiggle tails), should be destroyed in water barrels, casks and other water collections aboard the vessel, by the use of petroleum, or where this is not practicable, the receptacle should be covered by a mosquito netting to prevent the exit of the mosquitos from such breeding places.

In case of bubonic plague, special measures must be taken to destroy rats, mice and other vermin aboard the ship. In case of pneumonic plague, the patient should be isolated, the body discharges disinfected, especially the sputum, and the attendant on the case should wear a mask of gauze.

In case of typhus, special measures should be taken to destroy lice.

In the case of cholera, typhoid fever, or dysentery, the drinking water should be boiled and all foods thoroughly cooked. The discharges from the patient should be immediately disinfected and then thrown overboard.

If there is a ship's physician on board, an inspection of the vessel including the steerage should be made once each day.

Should any communicable disease appear on board ship while at sea, those who show symptoms of any of these diseases should be isolated and the Captain should note the illness in his log and all effects liable to convey the disease should be destroyed or disinfected. In the case of smallpox, every one aboard the ship at the time should be vaccinated.

The hospital should be cleaned as soon as it becomes vacant.

The dead, except those dead of yellow fever, should be wrapped in a sheet saturated with one of the strong disinfecting solutions

and without previous washing of the body at once buried at sea or placed in a coffin hermetically sealed.

A complete clinical record shall be kept by the ship's surgeon of all cases of sickness on board and the record delivered to the quarantine officer at the port on arrival.

The following disinfecting solutions are recommended for use at sea:

Formulae for Strong Disinfecting Solutions.

Bichloride of Mercury (1:500)

	Parts
Bichloride of mercury.....	1
Sea water.....	500

Mix

Carbolic Acid (5 per cent.)

Alcohol.....	50
Carbolic acid, pure.....	50

Mix

Then add fresh water..... 900

Formulae for Weak Solutions

Bichloride of Mercury (1:1000)

Bichloride of Mercury.....	1
Sea water.....	1000

Carbolic Acid ($2\frac{1}{2}$ per cent.).

Carbolic acid, pure.....	25
Fresh water.....	1000

Formalin (5 per cent.)

Formalin (or formal).....	50
Water.....	950

It is suggested that a vessel should carry for every 100 passengers: Bichloride of mercury, 5 pounds; carbolic acid, 10 pounds; alcohol, 10 pounds; formalin, 10 pounds; 100 pounds of sulphur and 12 Dutch ovens, about 12 inches diameter, and an adequate supply of fresh vaccine virus.

INSPECTION OF VESSEL

Every vessel subject to quarantine inspection entering a port of the United States should be considered in quarantine until given free pratique, and such vessel shall fly a yellow flag at the foremast head and shall observe all the other regulations of vessels actually quarantined.

No person, except the quarantine officer, his employees or pilot, shall be permitted to board any vessel, subject to quarantine inspection until the vessel has been inspected by the quarantine officer and granted pratique.

Special Measures Against Cholera at Foreign and Insular Ports

At ports where cholera prevails, special care should be taken to prevent the water and food supply from becoming infected. All drinking water, unless of known purity, shall be boiled and the foods thoroughly cooked and protected against flies, etc.

Water closets and toilets of vessels, including their discharge pipes, must be kept mechanically clean.

Certain foods which are usually consumed uncooked and which come from localities in which there is cholera or through such localities, should not be shipped. This is especially true of vegetables which are ordinarily eaten in the uncooked state.

Steerage passengers coming from cholera infected districts should be detained for five days in a place known to be free from any source of infection.

If cholera appears on board during the voyage, fruits and vegetables that are ordinarily eaten in the uncooked state shall either be destroyed or rendered harmless by cooking.

The water supply of the vessel shall be sterilized either by boiling or by chemicals.

The discharges of a patient and all those in immediate contact with him, shall be carefully disinfected before being disposed of.

Any part of the ship which has been soiled by the discharges from a cholera case shall be washed down with a strong solution of bichloride or carbolic acid.

Yellow Fever

Six days is considered the incubation period of yellow fever. At any port where yellow fever is known to exist, special precautions should be taken to prevent the introduction of mosquitoes (*Stegomyia*) on board the vessel. Water tanks, water buckets and other collections of water shall be guarded in such a way that they shall not become a breeding place for mosquitoes. Where the vessel has lain close to the shore, measures should be taken to destroy all mosquitoes which have come aboard.

Anyone sick of yellow fever shall be carefully protected by netting against mosquitoes. The ship shall be moored, if possible, at least 200 yards from the inhabited shores, since the mosquitoes will usually not fly that far. The ship should be fumigated for the destruction of mosquitoes. For the destruction of mosquitoes, there shall be a complete fumigation of all parts of the vessel at the same time by sulphur dioxide gas or by cyanide gas.

Plague

At ports or places where plague is suspected, every precaution shall be taken to prevent rats and mice from getting aboard the ship. Vessels sailing from such ports shall be fumigated in all parts for the destruction of rats if the vessel lies at a dock. All connecting lines must be guarded by inverted cones or disks not less than three feet in diameter and so fixed as to be always at right angles to the line to which they are attached.

A plague infected ship should be fumigated in all parts at the same time for the destruction of rats, including those that may be in articles of cargo.

Smallpox

For quarantine purposes, fourteen days is considered the incubation period for smallpox. All passengers and crew coming from smallpox districts or who have been exposed to smallpox should be vaccinated unless they can show satisfactory evidence of having had smallpox or a successful vaccination within one year.

Typhus

For quarantine purposes, 12 days shall be considered the incubation period for typhus. Clothing, personal effects and baggage

of those having typhus and those exposed to typhus shall be fumigated for the destruction of vermin (lice). All persons found to be vermin (louse) infested shall be treated for the destruction of lice.

Leprosy

No alien leper should be permitted to embark from a foreign port for a port in the United States either as a passenger or as a member of the crew. No alien leper shall be permitted to land.

DISINFECTION

Disinfection means the destruction of agents causing infection. An object is said to be infected when contaminated with germs which produce disease. The term "disinfection" relates only to the destruction of the vitality of those minute living particles called germs, which cause disease. It does not mean the destruction of all of the lower forms of animal and vegetable life, but only those which cause disease. Any process which destroys all the lower forms of animal and vegetable life is called sterilization.

There are a large number of agents which may be used in the process of disinfection. These include physical agents, such as: sunlight and heat, various chemical agents in solution and used in liquid form, and also certain gaseous agents. When a gaseous agent is made use of, it is called fumigation.

Many of the agents used in disinfection are highly dangerous and can be applied only by persons skilled in their use. These, in the case of a vessel, would be used at the quarantine station by the medical officer in charge. There are certain agents, however, which can be readily applied aboard ship by anyone of ordinary intelligence and will frequently be found useful. Not all parts of a vessel may need this disinfection, but only those parts which have become infected by the presence of some person or animal sick with a disease due to germs. Prompt disinfection, therefore, of a very small part of a vessel may later obviate serious quarantine delays and prevent the spread of infection aboard ship.

Physical Agents

Of course, any article which is burned is thoroughly disinfected. Likewise, any article which is immersed in boiling water for ten to fifteen minutes is actually sterilized. These two methods are applicable at all times. Exposure to sunlight, if prolonged, also results in disinfection, but should not be depended on too much.

Chemical Agents in Solution

Such agents as bichloride of mercury, carbolic acid, and cresol, in proper solution and properly applied, will serve admirably to disinfect floors, walls, bunks, and other similar places. In disinfecting a room, for example, these agents may be made use of effectively. They are easy of application and can be relied upon. Also bedding, clothing, and other similar articles may be immersed in such solutions for an hour or more, with the assurance that they are disinfected. Precautions will have to be taken to protect the hands to some extent when using these agents extensively, although the danger is by no means large. They are all poisonous.

Gaseous Agents

Disinfection by gaseous agents is called fumigation. It is a method of wide application and produces excellent surface disinfection. One of the best of these is hydrocyanic acid gas, called usually "cyanide disinfection." This gas is highly dangerous and very poisonous and should be used only by persons skilled in its use. Whenever a ship is being disinfected by cyanide gas, the crew should take great precautions and obey strictly the injunctions of the medical officer, because breathing this gas results fatally in a very short time.

Another agent less dangerous but very useful is the fumes of burning sulphur. Any person may use this as described below. Cyanide or sulphur gas are useful in destroying vermin. To disinfect a compartment after contagious disease it is far better

to use soapsuds and strong solutions of chloride of lime or other disinfectants.

Fumigation by Sulphur

For rats and mosquitoes, this fumigation is carried out by carefully stoppering up all ventilators, ports and other openings. The pot method of fumigation is the cheapest and simplest method for the use of sulphur. The only materials required are pots, sulphur, and a small quantity of alcohol. Broad, shallow pots should be used, though ordinary iron buckets may take the place of these, if necessary. For the killing of rats and mosquitoes, three pounds of sulphur must be burned for each 1000 cubic feet of air space. The sulphur is powdered, spread over the bottom of the pan or pot, alcohol sprinkled over it. This is lighted after all openings, whereby the sulphur gas could escape, are carefully closed up. If alcohol is not available hot coals may be used to start the sulphur burning. It must be borne in mind that burning sulphur causes the pots to become very hot, and to avoid the danger of fire, it is necessary to place them on objects which will not burn or are not injured by heat. This may be done by standing the sulphur pots in pans containing an inch or two of water. For the killing of vermin, the room should be exposed to the sulphur fumes for six hours.

Disinfection after Infectious Diseases

After acute, infectious diseases, in addition to sulphur disinfection the walls, bunks, floors, etc., should be thoroughly washed either with a 5 per cent. carbolic acid solution, a 1: 1000 bichloride of mercury solution, or with a 2 per cent. solution of cresol. All bedding, tableware, etc., used by the patient, or having come in contact with him, should either be boiled or burned, but should not be used by any other person until treated to kill the germs. If boiling or burning are not practical, the bedding, etc., may be immersed in a 5 per cent. carbolic solution, a 1: 1000 bichloride solution or in a 2 per cent. solution of cresol for at least an hour. All discharges from the patient should be sterilized by the

addition of an equal part of 5 per cent. carbolic solution and should stand for one hour before being thrown overboard.

When Fumigation is Necessary

Fumigating with cyanide gas or the fumes of burning sulphur is only needed to destroy rats, mice, fleas, mosquitoes and other vermin. In all instances where contagious disease has occurred, disinfection by washing down infected parts of the ship as in the preceding paragraph, is preferred. A room occupied by a smallpox patient, or a case of syphilis, typhoid fever, cholera, etc., can be made perfectly safe by thoroughly scrubbing decks, walls, ceilings, bunks, and stanchions first by soap and hot water and then by large quantities of freshly opened chloride of lime, using a one pound can of chloride of lime to two buckets of water. Or following a thorough scrubbing with soap suds, a 5 per cent. solution of carbolic acid or cresol, or a 1-1000 solution of bichloride of mercury may be used in the same way.

Disinfestation

When a person is sick of some germ disease he is said to be infected. The same term is used with regard to objects and places that harbor disease germs. But when a person or place harbors vermin such as lice, fleas, bed bugs, etc., we say he or it is infested. The destruction of the germs we call disinfection, and of the vermin disinfestation.

Since mosquitoes, fleas, lice, rats and other vermin convey disease their destruction is a matter of great importance, and this is especially true on board ships. Disinfestation is, therefore, just as important a process as disinfection.

Both the methods of disinfection and of disinfestation have been described above, but it is always wise to have clearly in mind which you are trying to do. What will destroy germs may not destroy vermin and what will destroy vermin may have no effect on germs. The great test of disinfestation is the finding of the dead bodies of the vermin when the process is finished.

Of course this can not be done with germs since they are too small to see.

One should not wait till disease occurs before ridding a vessel of vermin. The best and safest procedure is to keep the vessel and its personnel disinfested and then disease will not occur.

PART II

ANATOMY AND PHYSIOLOGY

The Skeleton

The framework of the human body is called the bony skeleton. The individual bones of this framework are joined together by means of bands called ligaments which act in much the same way as the straps of a hinge.

The bones are covered by a pad of muscles which are attached to the bones by means of leaders or tendons. When these muscles shorten, they move the bones and consequently, the whole frame. The muscles are covered by a layer of fat and over this the skin. There are about 200 bones in the body, divided roughly into long bones, irregular bones and flat bones. For example of each, see Figure 2.

The bones of the body are all named, but with the exception of a comparatively few, are of very little interest in first aid work. The principal bones and their relation are shown in the accompanying illustration, which is that of a complete skeleton with the principal bones indicated. See Figure 3.

Muscles

The individual muscles are of very little interest, as they do not work separately but in groups, each group having a certain function to perform. The accompanying illustration, Figure 4, shows the grouping and arrangement of the muscles of the body.

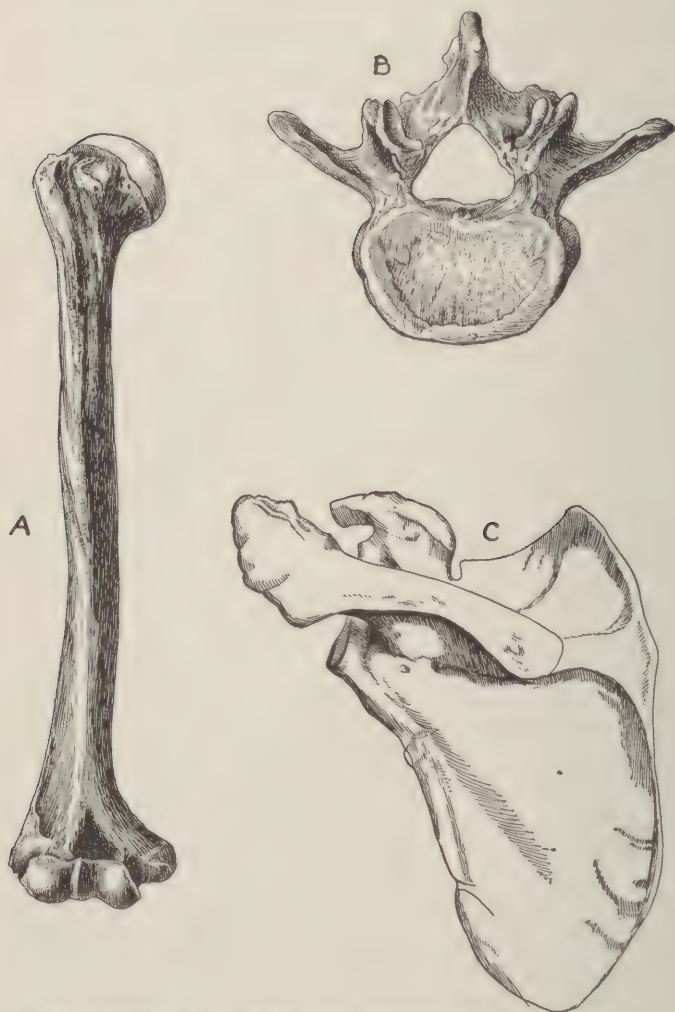


FIG. 2.—Long bone (humerus) A. Irregular bone (vertebra) B.
Flat bone (scapula) C.

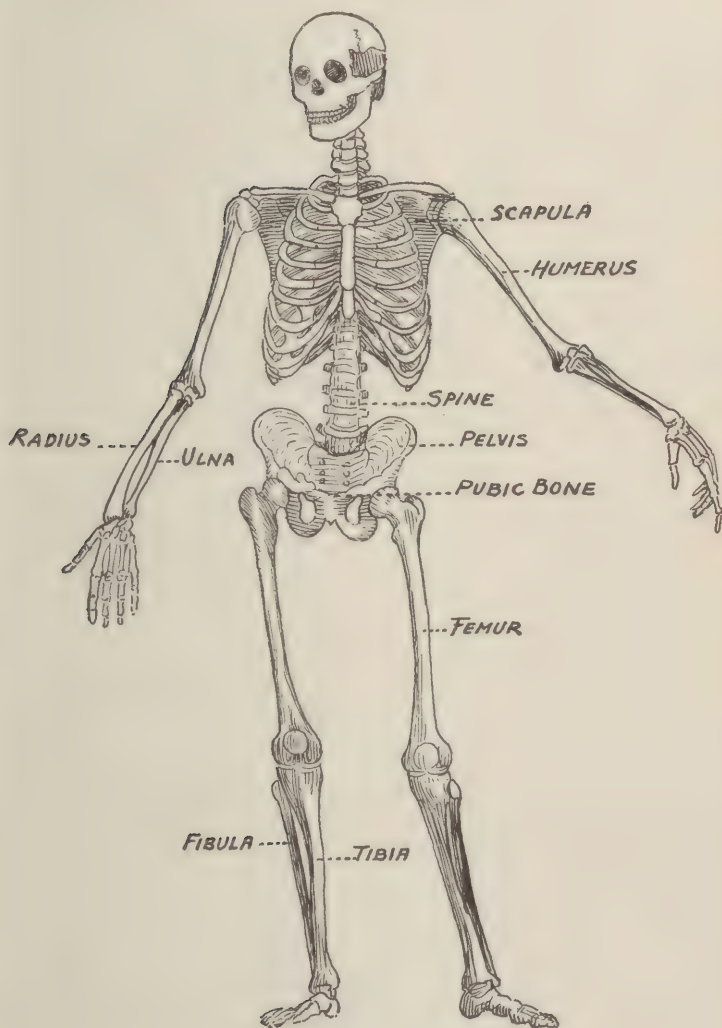


FIG. 3.—Human skeleton.

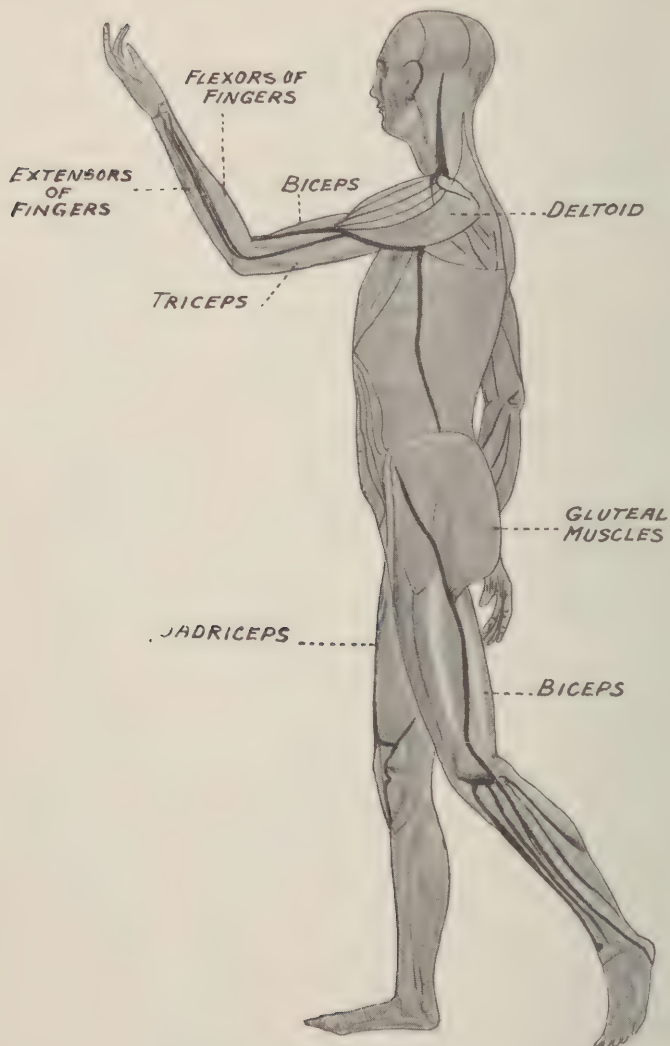


FIG. 4.—Muscles and muscle groups.

Arteries

The muscles, bones, fat, etc., are supplied with blood from vessels called arteries which run from the heart to the various parts of the body. Figure 5 shows the course and distribution of the more important of these vessels.

Veins

The veins are the vessels which carry blood from the various parts of the body to the heart. These veins are thin walled vessels which carry blood at very low pressure. Figure 6 shows the course and distribution of the more important of these vessels.

Circulation of the Blood

The general scheme of the circulation is shown by combining Figures 5 and 6. These illustrations show the heart as the center of the system located inside of the chest. Leading off from it is the aorta, or great vessel of the chest, which branches in the upper part of the chest to supply the head and arms, the main trunk continuing down the middle of the body to supply the abdomen and legs. The upper branches again divide so that they supply the upper extremities (arms) and the head and neck. The lower branch subdivides into numerous vessels which supply everything below the level of the heart. The great arteries are accompanied by corresponding veins which follow very much the same course, but in which the flow of blood is in the opposite direction; namely, toward the heart.

Through this system, the blood flows outward from the heart, through the arteries, and back through the veins, thus reaching all parts of the body.

Difference in Arteries and Veins

You will have noted that at times blood, coming from a cut vessel will spurt, while at other times it flows out slowly

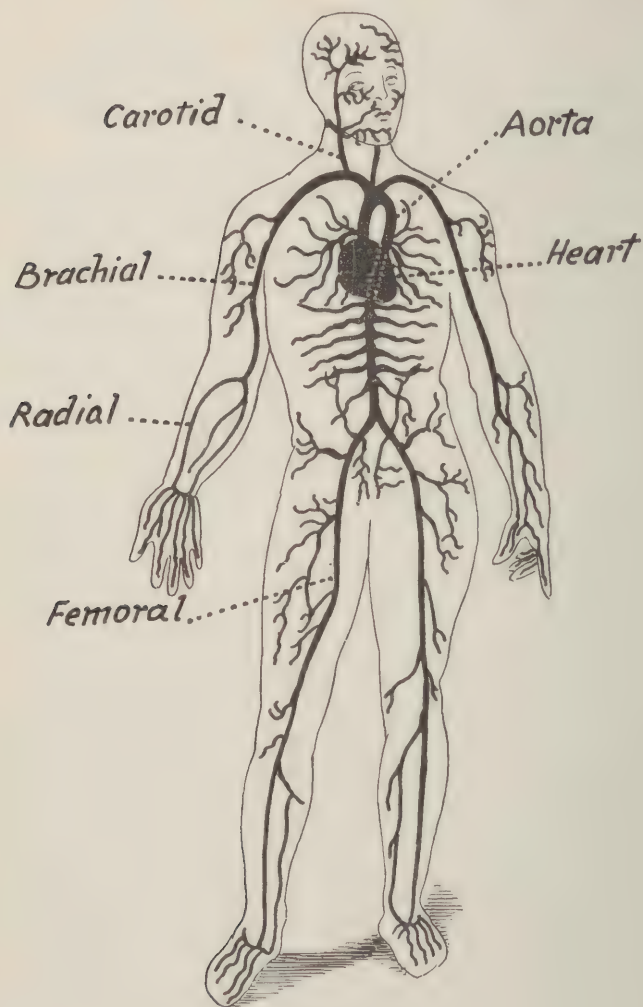


FIG. 5.—Arteries.

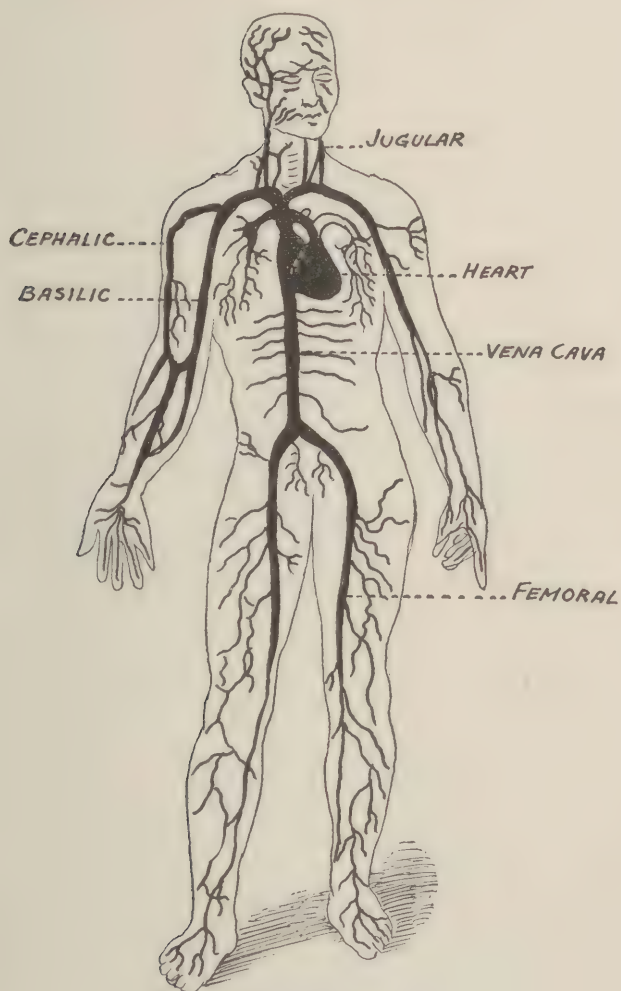


FIG. 6.—Veins.

and in a steady stream. This spurting blood comes from the arteries and is due to the action of the heart muscles which contract and force the blood from the arteries just as an ordinary pump would do. On the other hand, the blood flowing back to the heart through the veins flows at a very low pressure and does not spurt when a vein is cut, but simply continues to flow gently. This point is very important in injuries, because it indicates whether an artery or a vein has been cut.

Nerves

The brain, is located inside the skull and is connected up with the spinal cord which lies in a canal inside the back bone. From the brain and the spinal cord, small nerves branch out to all parts of the body. These correspond in many ways to telephone lines with a central exchange (the brain). The nerves carry messages either from any part of the body to the brain, or from the brain to the part. These messages cause the muscles to contract, or if from the other direction give a sense of pain. To explain—if one of the nerves is touched with a hot iron or the skin over it is touched, a sense of pain is felt because one of the nerves carried the message to the brain. As soon as the pain is felt in the brain, a message is sent out over one of the nerves, to a bundle of muscles and the part touching the hot iron is jerked away. In this way, the whole body is bound together into a unit. See Figure 7.

The Digestive Tract

The body receives its nourishment by digesting food substances taken into it through the mouth. An illustration of the digestive tract is shown here. Figure 8. The first part of the digestive tract is the mouth, including the teeth, which prepare the food for the use of the stomach. The food is chewed, mixed with saliva and swallowed. It goes to the stomach where a further process of digestion occurs. From there, it goes into the intestine or gut, where a part of it is



FIG. 7.—Nervous system.

absorbed into the blood for use in the various parts of the body as fuel. The remainder passes down into the great bowel and eventually is expelled as stool.

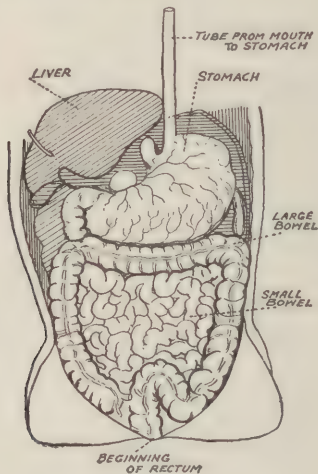


FIG. 8.—Digestive system.

The Kidneys and Bladder

Water, together with certain poisons formed in the body, is thrown off through the kidneys, which are shown in the accompanying illustration. Figure 9. The kidneys take water from the blood. From the kidneys it flows through two little tubes to the bladder and from the bladder is expelled in the form of urine.

The Lungs

Air is taken into the body through the windpipe which leads into the chest from the throat. This tube divides and subdivides until finally the tubes end in tiny air sacs. These air sacs are grouped into organs called lungs which are located in the chest, as shown in Figure 10.

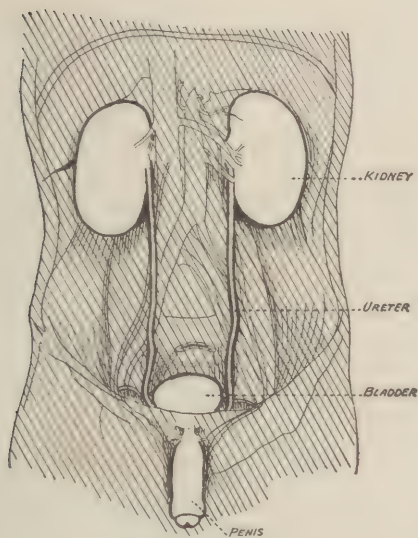


FIG. 9.—Urinary tract.

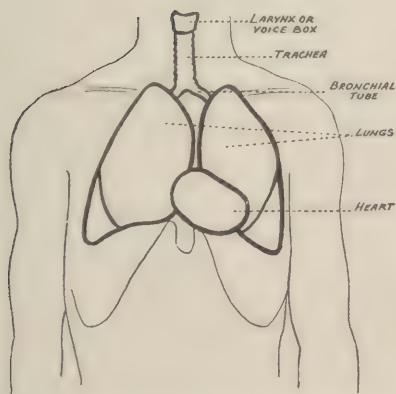


FIG. 10.—Organs of respiration and their relation to the heart.

TEMPERATURE AND PULSE

Normal Temperature

The body normally has a certain fixed temperature. This temperature is 37 degrees on the Centigrade scale or 98.6 degrees on the Fahrenheit scale. An illustration of a clinical thermometer is shown here. Figure 11. Very little practice will teach the method of telling temperature by means of it.



FIG. 11.—Clinical thermometer.

Fevers

Marked variations from the normal temperature usually mean disease. In fever, the temperature may go as high as 106 degrees Fahrenheit (41 degrees Centigrade), though this temperature is rather unusual. Due to exposure to cold or following a severe shock or injury with loss of blood, either internal or external, the temperature will probably drop below the normal and may be as low as 95 degrees Fahrenheit (36 degrees Centigrade). A temperature much below the normal is sometimes an indication of grave danger to an ill or injured person, although at times temperatures are found which normally are less than 98.6 degrees Fahrenheit (37 degrees Centigrade). Since the diagnosis of disease depends somewhat on the fever picture, in cases of illness, it is well to take the temperature at least twice a day, morning and evening, and to record it in such a manner that it can be shown to the physician at the first opportunity.

Taking Temperature

In taking temperature with a clinical thermometer, first shake down the mercury in the tube. Clinical thermometers

are self-registering and before using great care must be taken to shake down the mercury in the tube by giving the thermometer a sharp jerk while holding it in the hand. Before using see that the mercury is below the normal mark. Next put the mercury end of the thermometer under the patient's



FIG. 12.—Proper method of taking the pulse.

tongue and leave it there for at least two minutes; after which the thermometer is removed and the temperature read. In case the patient is unconscious, or if for any other reason cannot hold the thermometer under the tongue, the bulb may be greased and inserted into the rectum for about one and one-half inches. The rectal temperature will usually be slightly higher than the mouth temperature (about 1 degree). Another method

is to put the mercury bulb under the arm of the patient, holding the arm firmly to the side at the same time. The reading taken here will be about one degree lower than the mouth temperature.

Pulse

The pulse is the thump felt in an artery with each beat of the heart. In illness, a record should be made of the pulse rate, since it affords valuable information regarding the disease condition. The normal pulse in the adult male varies from 70 to 90 beats to the minute. The pulse is best taken by using the index and middle fingers of the right hand, the tips of which are placed in the hollow on the underside of the wrist of the patient just above the base of the thumb. Very light pressure should be made, as more marked pressure will shut off the pulse entirely. The accompanying illustration shows the proper method of taking the pulse at the wrist. Figure 12.

The pulse rate may also be taken under the angle of the jaw, the inside of the ankle, or in front of the ear. There is a fairly constant relation between the pulse rate and the temperature. If the temperature is 98.6 degrees Fahrenheit, the pulse rate is 76; if the temperature goes to 104, the pulse will usually increase to 100 or 110 or higher; so that a fair idea of the temperature can often be gained by the rapidity of the pulse.

PART III

SHIP'S SICK BAY AND MEDICINE CHEST¹

Before going on to a description of actual disease conditions and injuries, it will be well to outline here an ideal sick bay, together with a description of the medicine chest and directions for use of the drugs and appliances found in this chest.

"Sick bay" is the term applied to the space on board ship where members of the crew or passengers are given medical treatment. The term may include all that space devoted to hospital beds, dispensary, dressing rooms, isolation quarters, and toilet facilities in connection therewith. The sick bay should be located in a deck-house, aft, in order to obtain the greatest amount of ventilation and be convenient to the galley.

¹ In passenger ships, "the hospital shall be located in a space not below the deck next below the main deck of the vessel. The hospital space shall in no case be less than in the proportion of 18 superficial feet for every 50 such passengers who are carried or brought on the vessel, and such hospitals shall be supplied with proper beds, bedding, and utensils, and be kept so supplied throughout the voyage."

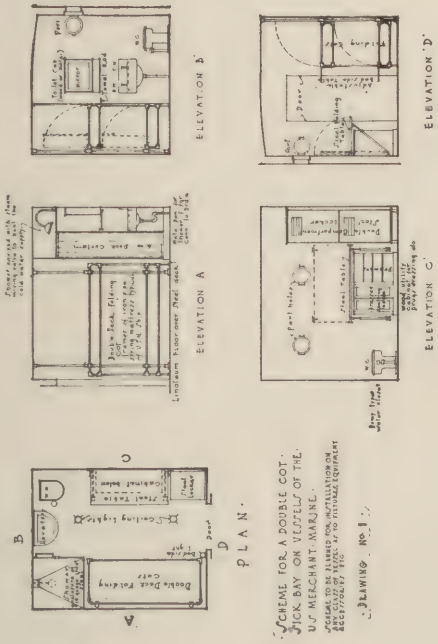
In the navigation laws of the United States, provision is made "that in addition to the space allotment for lodgings hereinbefore provided, on all merchant vessels of the United States which in the ordinary course of their trade make voyages of more than 3 days duration between ports and which carry a crew of 12 or more seamen, there shall be constructed a compartment suitably separated from other spaces for hospital purposes, and such compartment shall have at least one bunk for every 12 seamen constituting her crew, provided that not more than 6 bunks shall be required in any case." Navigation Laws, U. S., 1920, pp. 30 and 170.

The medicine chest required by law, containing such surgical instruments, medical comforts, and medicines necessary for the treatment of diseases and accidents incident to sea voyages, should be carried in the sick bay, together with such facilities as a dressing table, instrument table, and toilet facilities for exclusive use of sick or injured.

The sick bay will vary, according to the number in the crew and may contain from two to eight bunks. The berths for the sick bay should be located so that an attendant can readily get to the patient to care for him. The room should be well lighted and well ventilated and should contain lockers, so that the seaman's belongings can be stored in the room with him. Arrangements should be made for toilet facilities. A commode or hopper, either of the flush type or a box with a seat and bucket, should be placed in this room or in an adjoining closet. It is also necessary to have some sort of arrangement for washing the hands and face, since very often the patient is not able to go on deck or to go to the regular washroom, yet it is necessary to have toilet facilities.

In drawing No. 1 are sketches illustrating the minimum requirements for sick bays on merchant ships. The plan is offered as a standard scheme to be applied to any type of vessel. It consists of two beds in tier, of the Navy type, i.e., pipe frames affixed to stanchions, from which beds may be removed and utilized as litters; a shower bath, water closet and lavatory adjacent (which may be separated from the sleeping compartment by a bulkhead); a folding table over the medicine chest and a steel locker for the patient's personal effects.

In drawing No. 2, there are two compartments; that for hospital purposes consisting of four or eight cots (in single or double tier). The other compartment consisting of toilet facilities, including shower; attendant's cot which may be folded out of the way when not in use; a dressing table for emergencies, which may also be folded and put to one side; a medicine chest and an instrument table. This latter space may be used as a dispensary and the bunk room, if necessary can be converted into an isolation ward.

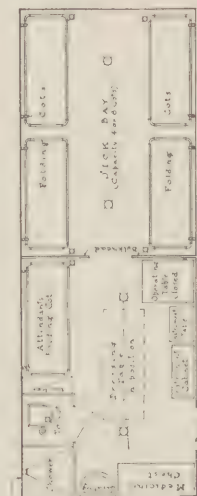


SCHEME FOR A DOUBLE COT.
SICK BAY ON VESSELS OF THE
U.S. MERCHANT MARINE.
DESIGNED TO BE ADAPTED FOR INSTALLATION ON
ANY CLASS OF VESSEL AND TO FURNISH EQUIPMENT
REQUISITE.

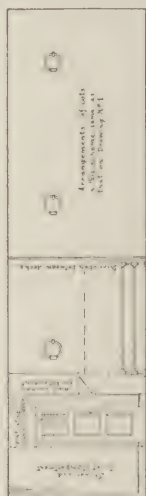
DRAWING No. 1

59

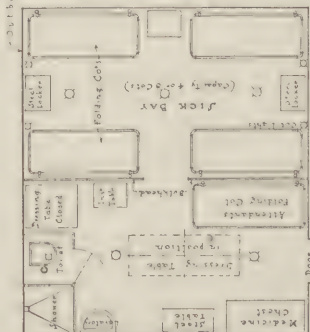
SP. 2 d/s/10.



PLAN - SCHEME NO. 3.



ELEVATION.
SCALE 1/2" = 1'-0"



PLAN - SCHEME NO. 2.
SCALE 1/2" = 1'-0"

Notes.
The general selection of fittings, furniture and all other articles should be made with reference to the type and conditions of space available on vessels.

SCHEMES FOR 4 or 8 COT SICK BAYS
OF THE U.S. MERCHANT MARINE
DRAWING NO. 2.

MEDICINE CHEST

The medicine chest should be equipped with the drugs and appliances listed below. Following this list, each drug is taken up individually and directions are given for its use and instructions as to when it is to be used. There is also a list of surgical instruments and appliances for first aid work. The directions for their use will be found under surgical first aid.

DRUGS AND CHEMICALS

Cathartics

1. Calomel tablets (grains $\frac{1}{2}$), 500.
2. Castor Oil, 1 quart.
3. Compound Cathartic (C.C.) Pills (vegetable), 1000.
4. Salts (Epsom), 4 lbs.

Hypodermic Tablets

5. Morphin Sulphate (grains $\frac{1}{4}$), 50.
6. Apomorphin Hydrochloride (grains $\frac{1}{10}$), 25.
7. Novocain and Adrenalin (grains 1), 100.
8. Strychnin Sulphate (grains $\frac{1}{30}$), 100.

Tablets, Pills and Capsules for Internal Use

9. Morphin Sulphate (tablets—grains $\frac{1}{4}$), 100.
10. Aspirin (tablets—grains 5), 1000.
11. Brown's Cough Mixture (tablets—grains 20), 100.
12. Codein and Terpin Hydrate Tablets, 500.
13. Copaiba and Santal Oil (capsules—5 drops of each), 1000.
14. Ipecac (Aleresta) (tablets—grains 5), 100.
15. Powdered Opium (capsules—grains 1), 25.
16. Quinine Sulphate (capsules—grains 5), 1000.
17. Sodium Bicarbonate (tablets—grains 5), 1000.
18. Sun Cholera (tablets—grains 5), 250.
19. Triple Bromide (tablets—grains $7\frac{1}{2}$), 250.
20. Codein Sulphate (tablets—grains $\frac{1}{2}$), 100.

Ointments

21. Petrolatum (Vaseline), 2 lbs.
22. Ichthyol Ointment (20 per cent.), 1 lb.
23. Mercury Ointment, 2 lbs.
24. Sulphur Ointment, 2 lbs.
25. Boric Acid Ointment, 2 lbs.

External Use Only

26. Cocain Solution (1 per cent.), 1 ounce.
27. Carbolic Acid (pure), 1 lb.
28. Tincture of Iodine, 16 ounces.
29. Turpentine Liniment, 4 qts.
30. Potassium Permanganate (tablets—grains 1), 250.

Powders

31. Boric Acid, $\frac{1}{2}$ lb.
32. Bismuth Subnitrate Powder, 1 lb.
33. Calomel Powder, 1 lb.

Antiseptics and Disinfectants

34. Bichloride of Mercury (tablets—grains $7\frac{1}{2}$), 500.
35. Cresol Solution (compound), 1 lb.
36. Soft Soap (surgical), 1 lb.
37. Sulphur (roll), 100 lbs. (See page 35, bottom.)
38. Carbolic Acid (crude), 10 lbs. (See page 35, bottom.)
39. Calcium Hypochlorite (tablets—grains 15), 500; or Chloride of Lime in 1 lb. cans.

Miscellaneous

40. Alcohol (grain), 1 pint.
41. Chloroform ($\frac{1}{2}$ -ounce vials), 6.
42. Laudanum, 4 ounces.
43. Tincture of Myrrh, 4 ounces.
44. Alkaline Antiseptic Tablets, 500.
45. Amyl Nitrite Pearls, 25.
46. Fluid Extract of Ergot, 4 ounces.

SURGICAL AND GENERAL SUPPLIES

- 1 Pair Bandage Scissors.
- 2 Pair 6 inch Pointed Scissors.
- 1 Pair Heavy Blunt Scissors.
- 6 Artery Forceps.
- 1 Pair Tissue Forceps.
- 1 Pair Dressing Forceps.
- 3 Knives—2 Operating—1 Pointed Bistoury.
- 12 Silk Ligatures on Needles in Tubes.
- 12 Assorted Needles (surgical).
- 4 Catheters, rubber (assorted).
- 1 Catheter, metal.
- 2 Probes, silver.
- 500 Wooden Tongue Blades.
- 12 Tubes Catgut.
- 6 Tubes Linen.
- 2 Dozen Safety Pins.
- 1 Tourniquet.
- 2 Bdls. Yucca Board.
- 2 30 inch Basswood Splints.
- 100 Compressed Bandages—3 inch.
- 25 Compressed Bandages—1½ inch.
- 3 Clinical Thermometers (Fahrenheit).
- 2 Hypodermic Syringes.
- 8 Rolls Adhesive Plaster—1 to 4 inches, assorted—5 yards.
- 50 Yards Gauze, Sterile, in 10 yard lots.
- 2 Dozen packages Gauze—1 yard each.
- 4 Pounds Absorbent Cotton.
- 6 Muslin Bandages, Triangular.
- 2 Yards Gauze Iodoform.
- 1 Foot and Leg Splint.
- 12 Roller Bandages, Muslin.
- 4 Hand Brushes, good quality.
- 12 Urethral Syringes.
- 1 Fountain Syringe.
- 1 Urinal, Enameled.

- 1 Weight and Pulley.
- 10 Yards Muslin.
- 2 Rubber Sheets.
- 4 Sand Bags.
- 12 Suspensory Bags.
- 6 Flannel Bandages.
- 1 Bed Pan.
- 6 Medicine Droppers.
- 2 Feeding Cups.
- 5 Yards Flannel.
- 2 Hot Water Bags.
- 2 Ice Bags.
- 1 Foot Bath.
- 12 Medicine Glasses.
- 6 Graduated Glasses.

The quantities given above are estimated to be sufficient for a vessel carrying about 100 persons on a voyage of about one month. Quantities may be reduced for a smaller personnel or for shorter voyages.

CATHARTICS

1. Calomel in $\frac{1}{2}$ Grain Tablets.

Calomel is a compound of mercury and is a strong mineral cathartic. It can be given in doses of one to five grains but should not be used frequently as it tends to cause mercury poisoning. For any condition where a thorough cleaning out is necessary, calomel is best given in $\frac{1}{2}$ grain doses; $\frac{1}{2}$ grain every 20 to 30 minutes until six doses have been given. After a period of four hours, this is followed by a dose of either epsom salts or castor oil. By following the calomel with salts or oil, the mercury is worked off and poisoning will not occur. If desired, calomel can be given in one dose instead of broken doses. If one dose is given, it should be of from three to five grains and followed afterward by salts or oil, just as in the case of broken doses.

2. Castor Oil.

Castor Oil is a vegetable cathartic and is comparatively harmless even in very large doses. It should be given in doses of from two to four tablespoonfuls (one to two ounces) at a time. This is one of the safest cathartics that can be used but is disagreeable to the taste. By giving it in orange or lemon juice, the taste is not so noticeable.

3. Compound Cathartic or C.C. Pill (Vegetable).

These are, as their name indicates, cathartic pills. They are given in doses of from one to three pills and should be followed by a swallow of water. They are a safe and efficient cathartic.

4. Epsom Salts.

Epsom salt is also a good cathartic. It produces a profuse watery stool and may be used after calomel in place of castor oil or it may be used alone as a cathartic. Epsom salt is given in doses of from two to six heaping teaspoonfuls of the dry salt, mixed in water. If the salt is given in hot water, a tablespoonful or more to the glass, the action is more prompt and efficient.

TABLETS—Hypodermic

5. Morphin Sulphate.

Caution.—Read directions carefully before using.

Morphin sulphate is one of the most important articles in the medicine chest. It is furnished in two forms; one for use by mouth, No. 9, and the other for use in the hypodermic. Morphin is the most effective drug known for the relief of pain and is used for this purpose only. It is a habit forming drug and should be kept carefully locked up. It is not to be used except in case of very severe pain but when it is needed in this capacity, nothing else will take its place. Given in sufficiently large doses, it will completely relieve pain, though in larger doses it may cause death. It is given to adults in $\frac{1}{4}$ grain doses by hypodermic. If the pain is not considerably relieved in one-half hour after giving, the dose should be repeated. The tab-

lets for use by mouth, No. 9, are also in $\frac{1}{4}$ -grain doses. If the pain is very severe, the first dose by mouth should be $\frac{1}{2}$ grain for the adult. This may be repeated once. Under no circumstances should more than one grain of morphin be given by mouth within a period of four hours, nor more than one-half grain of morphin by hypodermic in the same length of time. (For use of the hypodermic, see page 118.)

6. Apomorphin Hydrochloride.

Caution.—Read directions carefully before using.

Apomorphin hydrochloride is used for an entirely different purpose than morphin. It is used hypodermically to cause vomiting, especially in cases where some person has swallowed poison and it is desired to empty their stomach at once. Injected by means of the hypodermic in $\frac{1}{10}$ grain doses, it will cause vomiting within ten minutes. Not more than one dose should be given and this dose should not exceed $\frac{1}{10}$ grain.

7. Novocain and Adrenalin.

Caution.—Read directions carefully before using.

Novocain and adrenalin is used to produce local anesthesia or insensibility to pain. This drug when mixed with water and injected in the skin, will cause an absolute numbing and loss of pain sense in that part immediately around the site of the injection. Novocain is used in one per cent. solution for injection, so that to make the proper strength solution one grain tablet is added to one and one-half teaspoonfuls of water and allowed to dissolve. This solution, properly used, is almost harmless and as much as 10 or 12 tablets can be injected if necessary, to cover a good sized area.

8. Strychnin Sulphate.

Caution.—Read directions carefully before using.

Strychnin sulphate is a strong stimulant and is used where the breathing and heart action are poor and it is desired to "whip them up." It can be given hypodermically, or by mouth, in doses of $\frac{1}{30}$ of a grain. This can be repeated every three hours, if necessary.

TABLETS, PILLS AND CAPSULES FOR INTERNAL USE**9. Morphin Sulphate.**

See No. 5.

10. Aspirin.

Aspirin, in five grain tablets, is an extremely useful drug. It is given to reduce fever, for headaches, for rheumatism or pain in the joints and muscles, and for colds. The drug is used in doses of one to two, five-grain tablets, which may be repeated every four hours if necessary. No more than sixty grains should ever be given in twenty-four hours, and the use of this quantity should not be continued for more than three days at a time. It can be given in small doses, five grains every four hours over periods of days. Aspirin should be taken with water or milk or with a little food, as it tends to upset the stomach.

11. Brown's Cough Mixture—Tablets, Grains 20

This is a cough mixture put up in the form of lozenges and contains a small amount of opium. These tablets are used to "loosen up" and to control cough. One of the tablets is allowed to dissolve on the tongue and the solution swallowed. This should be repeated every hour or so until some relief is obtained.

12. Codein and Terpin Hydrate Tablets.

This is another excellent combination of drugs which is used for the control of cough. These tablets are taken in doses of one or two every three hours for cough, if necessary. They are best followed by a swallow of water.

13. Copaiba and Santal Oil—5 drops each.

Copaiba and santal oil capsules, containing five drops of each of these drugs, are used in the treatment of acute gonorrhea, "clap," especially during the stage in which there is a considerable amount of burning on passing water. This mixture does not have a curative action but merely relieves the burning. From two to three of these capsules three times a day during the acute period of the disease will greatly aid in the relief of the pain.

14. Ipecac (Alcresta)—Grains 5.

Ipecac, Alcresta, is used largely in the treatment of amoebic dysentery. These tablets are better than the ordinary ipecac preparation because they do not cause nausea. They are taken in doses of from one to three tablets, three times a day as long as the dysentery continues. Ipecac is useful only in that form of dysentery caused by the amoebae.

15. Powdered Opium—Grains 1.

Caution.—Read directions carefully before using.

Powdered opium is used chiefly to stop griping of the bowels during attacks of dysentery or diarrhea, although it may occasionally be used for the relief of pain. It is rarely given in doses of more than one grain at a time, although occasionally, two grains may be necessary. It is not to be repeated within 4 hours.

16. Quinine Sulphate Capsules—Grains 5.

Quinine is the one and only drug to be used in the treatment of malaria or in the prevention of malaria. As a preventive, while in a malarious district, quinine should be given in doses of not to exceed five grains, once a day. The drug is used in obscure fevers in five or ten grain doses every four hours. In malaria, it is given in doses of ten or fifteen grains every four hours, until two hundred grains have been given, when it is discontinued for a period of twenty-four to forty-eight hours, and then another series of doses is taken.

17. Sodium Bicarbonate—Grains 5.

Sodium bicarbonate, or baking soda, in five grain tablets, will be found very useful for the relief of "heartburn" or distress in the stomach after eating (indigestion), and can be given in almost any amount without doing any damage. The tablets should be dissolved in a little water before being taken or should be crushed and taken as a powder. During the acute stage of gonorrhea, 20 grains of sodium bicarbonate and a glass of water taken every two hours will relieve the pain on urination.

18. Sun Cholera Tablets.

Sun Cholera Mixture, which contains several of the hot oils and a small amount of opium, is put up in tablets of five grains each. This mixture is used to relieve the distress in cramps and diarrhea, as well as to reduce the number of stools. These tablets are taken in doses of one or two every three hours until relief is obtained.

19. Triple Bromide—Grains $7\frac{1}{2}$.

Bromides are used in nervous conditions and in sleeplessness. They are comparatively harmless substances and are used in doses of from twenty to sixty grains. The tablets are best dissolved in water and taken in that way.

20. Codein Sulphate Tablets—Grains $\frac{1}{2}$.

Caution.—Read directions carefully before using.

Codein is used to relieve pain, where something more mild than morphin or opium will answer. This drug is very efficient if given with aspirin. It is given in doses of $\frac{1}{2}$ grain by mouth. This may be repeated every four hours, if necessary.

OINTMENTS

21. Petrolatum (Vaseline).

Petrolatum is a substance which is used wherever a lubricant is needed about the body or wherever a non-irritating dressing is needed for a wound or sore, and is used to dilute or thin other lubricants which may be too stiff. It is an excellent dressing for burns as it excludes the air and reduces pain to a minimum. As a surgical dressing, petrolatum should be sterilized by putting the container in a bath of boiling water and heating it at that temperature for twenty or thirty minutes. A convenient method of carrying petrolatum is to have it put up in collapsible tubes.

22. Ichthyol Ointment (20 per cent).

Ichthyol Ointment is an excellent substance for the relief of local pain and swelling, especially around joints. It is valuable also in the treatment of swollen testicles. It is used by smearing a thick layer of it over the sore or tender part.

23. Mercury Ointment.

Mercury, or blue ointment, will be used aboard ship to get rid of crab lice. It is occasionally used as a dressing for ulcers and sores, especially leg ulcers. For getting rid of crab lice, it is smeared over the hairy parts and allowed to remain from one to two days. After which the parts are to be well washed in soap and water.

24. Sulphur Ointment.

Sulphur ointment is used chiefly to get rid of scabies or itch. It is also used in many skin diseases, especially those affecting the scalp. When using sulphur ointment to get rid of itch, the body should be rubbed thoroughly for three successive nights without a bath, following which, the clothes are changed completely and a thorough bath is taken. It may be necessary to repeat this treatment a second time.

25. Boric Acid Ointment.

Boric acid ointment is used in very much the same way as vaseline. It is vaseline containing boric acid. It has a mild antiseptic action. It makes an excellent dressing for burns.

EXTERNAL USE ONLY**26. Cocain Solution—1 Per Cent.**

Cocain is a valuable local anesthetic but absorbed into the system in any large amount, it causes severe poisoning, sometimes death. This solution is carried in the medicine chest for one purpose, and that is the removal of foreign bodies from the eye. To do away with the sensitiveness of the eye ball, one drop of 1 per cent. cocain solution is dropped on the eye ball. This is repeated every three minutes until three drops have been instilled, when it will be found that foreign bodies can be removed from the surface of the eye ball without pain to the patient

27. Carbolic Acid—Pure. POISON.

Caution.—Read directions carefully before using.

Carbolic acid (pure), is a very strong caustic and is used

largely for cauterizing purposes. It is also a strong antiseptic. (For its use as an antiseptic, see No. 38.) Carbolic acid is also useful to stop toothache. A very small amount of it put on a bit of cotton and inserted into a hollow aching tooth will relieve the pain.

Carbolic acid even in weak solutions should never be used for dressing wounds of any kind. When applied to the skin for a length of time it may cause gangrene. If spilled on the skin accidentally it can be removed best with alcohol applied promptly.

28. Tincture of Iodine.

This substance is the best all-round antiseptic to use on or about the body. Before a boil is opened, the skin over it is painted with tincture of iodine. Before any operation, the skin about the site of the operation is painted with tincture of iodine. Before a cut or wound is sewed, its edges are painted with tincture of iodine. It is also used to paint over sore joints or bruises or sprains. Care should be taken not to apply this substance in strong solutions and then cover it over with cloths as it may blister the skin and at times even cause the skin to slough. Any excess of it can be removed by washing the skin with alcohol.

29. Turpentine Liniment.

Turpentine liniment is a good, all-round liniment for use in soreness, bruises, sprains, etc., though quite as much benefit comes from the rubbing as from the liniment itself. Turpentine liniment is very strong and in tender skinned individuals may cause blistering.

30. Potassium Permanganate.

Potassium Permanganate in solution is used in the treatment of acute or chronic gonorrhea, "clap," and as an antiseptic wash for any sore or ulcer, especially those having a bad odor. One, one grain potassium permanganate tablet added to a quart of warm water makes a solution of about the right strength for injection in case of gonorrhea. This is also about the proper strength for an irrigating solution or for a wash. Should the solution lose its color make up a fresh solution.

POWDERS

31. Boric Acid.

Boric acid powder is used as a dressing for wounds wherever it is desired to use some mild antiseptic dressing. Boric acid is also used in making a solution to be used as an eye wash. Four level tablespoonfuls of boric acid dissolved in one pint of boiling water makes a satisfactory eye wash. This is the right strength for wet dressings for wounds or burns.

32. Bismuth Subnitrate Powder.

Bismuth Powder is used occasionally for the treatment of wounds, although, ordinarily, it is used in quarter level teaspoonful doses to stop excessive bowel action in diarrhea. Mix it with water or take dry and follow with water.

33. Calomel Powder.

Calomel powder is used as a dressing for wounds, sores and ulcers, especially those occurring about the genital organs. It is valuable as a dusting powder wherever an antiseptic dusting powder is needed.

ANTISEPTICS AND DISINFECTANTS

34. Bichloride of Mercury. POISON.

Caution.—Read directions carefully before using.

Bichloride of mercury is a poison and should be handled as such. It comes in tablets containing $7\frac{1}{2}$ grains each. It is used in solutions as an antiseptic wash and as a wet dressing for soaking infected wounds. As a wash it is used in strengths of 1 to 2000 or one tablet of bichloride to a quart of water. For wet dressings or for the soaking of wounds, it is used in strengths of 1 to 5000 or one tablet to each $2\frac{1}{2}$ quarts of water. The other form of bichloride carried is the crude powdered bichloride. This is used for scrubbing infected decks, walls, bunks, etc., or for soaking infected bed clothes or linens. It is usually used in strengths of 1 : 1000. In quantities, this is made up by adding one teaspoonful of powdered bichloride of

mercury to a gallon of water. **Bichloride of mercury must not be used internally.**

35. Compound Cresol Solution. **POISON.**

Caution.—Read directions carefully before using.

This substance is used as a disinfectant only. It should never be taken internally and should very rarely be used on the body. It is an excellent disinfectant for scrubbing infected surfaces, for soaking clothes or for disinfecting discharges from those sick with infectious diseases. It is used in from 2 per cent. to 5 per cent. solutions. A 2 per cent. solution is made by adding approximately one tablespoonful of pure cresol solution to each quart of water.

36. Soft Soap (Surgical).

Soft soap is used for scrubbing the hands and arms before any surgical operation is performed; for scrubbing the part on which the operation is to be performed, and for any other use where a good soap is required.

37. Sulphur (roll).

Roll sulphur is carried as an emergency fumigating agent for the destruction of rats, mice and mosquitoes as well as germs. For directions for its use, see chapter on fumigation.

38. Carbolic Acid. **POISON.**

Caution.—Read directions carefully before using.

Crude carbolic acid is used as an antiseptic in much the same way as cresol. It is used in a 5 per cent. solution for washing down decks, walls, bunks, or for soaking clothes and disinfecting discharges from persons for the purpose of sterilizing them. A 5 per cent. solution is made by using 50 parts alcohol, 50 parts carbolic acid, pure, and 900 parts fresh water.

39. Calcium Hypochlorite (tablets); Chloride of lime (bleaching powder) in cans.

Calcium hypochlorite or chloride of lime is used for sterilizing infected drinking water. One tablet (15 grains) is crushed and made into a paste with a little water. This paste is added to each barrel of water to be treated, and allowed to stand one-half

hour before use. Powdered chloride of lime may be used in the same way as the tablets, $\frac{1}{4}$ to $\frac{1}{2}$ teaspoonful of the powder being used instead of a tablet. Mix well.

MISCELLANEOUS

40. Alcohol—grain.

Caution.—Read directions carefully before using.

Grain alcohol can be used internally in cases of shock or collapse or after prolonged exposure. It is used in the same way as whiskey, after mixing with an equal amount of water. The quantity should be one half less than whiskey. Denatured alcohol is used as an antiseptic, especially for rinsing the hands before a wound is dressed or before an operative procedure is performed or for washing the skin of the patient before a cut is made. Denatured alcohol is never used internally in place of whiskey. Be sure that you have only pure grain alcohol for internal use. **Do not use denatured or wood alcohol internally.**

41. Chloroform.

Caution.—Read directions carefully before using.

Chloroform is an anaesthetic which is used for producing sleep during painful surgical operations, etc. It is used by having the patient breathe its vapor. It is highly dangerous and should not be used by any one not skilled in its use except in case of absolute necessity.

If possible the patient who takes it should have an empty stomach (no meal for some hours beforehand). The patient, lying down, is given chloroform by placing over his mouth and nose a mask of some kind upon which the chloroform is dropped slowly while he breathes the vapor. In the absence of a mask, a piece of cloth may be used over the mouth and nose held up off the skin. Chloroform is irritating to skin and eyes. It is well to protect skin by greasing with vaseline.

During its administration respiration and pulse must be watched with great care.

42. Laudanum.

Caution.—Read directions carefully before using.

Laudanum, or tincture of opium, is a valuable drug which is used in much the same way as powdered opium; for the relief of pain and to stop griping and cramps in the belly. It is given in doses of from five to ten drops in water, which may be repeated, if necessary.

43. Tincture of Myrrh.

Tincture of myrrh is a valuable remedy for use in the mouth and on the gums, especially in case of scurvy or in cases of mercury poisoning, in which the teeth have become loosened and the gums are sore. A few drops of tincture of myrrh sprinkled on the tooth brush before brushing the teeth or rubbed on the gums will do a great deal to harden them and prevent sore mouth.

44. Alkaline Antiseptic Tablets.

Alkaline antiseptic tablets are used in making up gargles and mouth washes. They are not poisonous. One of these tablets dissolved in a glass of water makes an excellent mouth wash or gargle.

45. Amyl Nitrite Pearls.

Amyl nitrite is a substance used to relieve the severe pain and cramping which occurs in a certain form of heart disease known as angina pectoris. For this purpose, one of the pearls is crushed in a handkerchief and the fumes inhaled cautiously.

46. Fluid Extract of Ergot.

This is included for one purpose only and that is for use if necessary after childbirth (see page 152). It should not be given until after the expulsion of the "after-birth." Dose: teaspoonful in water. Repeat in four hours, if necessary.

Foods for the Sick

While not exactly a part of the ship's medicine chest, nevertheless provision should always be made on every vessel for feeding those who may be taken sick on the voyage. There should be included in the ship's stores a moderate quantity of such articles as canned soups and broths (small), beef extract in one form or another (there are convenient cubes on the market), some form of gelatin, easy of preparation, some acceptable form of powdered milk, or malted milk, or both, crackers or biscuits in tins, of course oatmeal and barley for gruels and soups. Tea, coffee, cocoa or chocolate will be found useful.

NOTE.—Attention is called to page 28, paragraph on Prevention of Venereal Diseases. Directions are there given for certain measures to prevent these diseases. The calomel ointment, protargol and argyrol solutions are not listed in the ship's medicine chest.

If the master should try to make use of such things to prevent venereal disease he can readily obtain them at any drug store. But solutions of protargol and argyrol do not keep well and should be renewed every week or so. This makes them difficult to use on board ship. Argyrol is perhaps more convenient for use on ship board. If a standard size bottle is used the argyrol could be weighed out by the druggist in small quantities and each small quantity put up in small bottles so that the contents of one small bottle added to the standard bottle filled with water would give the proper solution (20 per cent). Argyrol solutions should be protected from the light.

There are on the market sanitary packets containing collapsible metal tubes of preparations which may be satisfactorily used for preventing venereal disease if selected on the advice of some medical man who is familiar with them.

The master should understand that any effective method of preventing venereal disease requires careful planning and intelligent supervision.

PART IV

MEDICAL FIRST AID

GENERAL CONSIDERATIONS

Various diseases and conditions are described under Medical First Aid and Surgical First Aid. There are, however, many general things which may be said of all, whether medical or surgical.

Diagnosis even for the doctor is often difficult, but much can be done for the sick without accurate diagnosis by treating their symptoms. That is, we can take care of the sick man by treating him for the things of which he is complaining whether we know exactly what disease he may be suffering from or not.

In all treatment we must remember that sick people are not themselves and require much patience in handling, that too much treatment is worse than too little, and that whatever treatment we do give should not be harmful. Also, when we suspect some man is playing sick, let us not forget that mistakes are easily made. It is better to have one man play sick and "get away with it" than to treat a really sick man cruelly because we suspect him to be shamming.

Nursing the Sick

The general care and nursing of the sick is frequently of more importance than medicines. On board ship any sort of nursing is often difficult, but rest in bed, proper feeding and some sort of general care is perhaps always possible to some degree.

Any person who has fever or who feels generally bad should go to bed. The bed should be in as quiet a place as possible, the room should be properly heated and also ventilated. The sick need fresh air. The bed and bedding should be clean and as comfortable as possible and free from lumps or wrinkles. Put patient in night shirt or pajamas if possible.

Special attention should be given to food and water. Any person with fever should have only liquid food. This should be given regularly every two or three hours, with a feeding cup if the patient is very ill to prevent the exertion of sitting up each time. It is always well to see that the sick get plenty of water, and it should be given whether asked for or not.

It is always wise to watch the bladder and bowels of the sick. Unless urine is passed catheterization may be necessary. Bowels must be kept open by an enema every other day, or by the use of some purgative, if necessary.

Medicines should be given regularly, usually with a little water. Care must be always taken to read labels and be sure the right medicine and the right dose is given. Do not guess at the dose, always measure it. Unless great care is exercised in these matters some one may be poisoned.

Whenever possible a few notes should be kept regarding the patient, when he was taken sick and how, his progress each day and a record of his temperature and pulse. This information will be of value to the doctor when he sees the case. It also shows how the patient is getting along.

Everything around should be kept clean. If possible, give the patient a sponge bath every day, change his clothing frequently, keep his mouth clean and look after his back to prevent bed sores by rubbing with a little alcohol and keeping clean and dry. Also turn him from side to side and do not let him lie on his back too much. Protect the mattress with a rubber sheet.

What is passed by the bowel and bladder, as well, as what he spits up must be carefully disposed of. Bed pans and urinals and all appliances used must be kept clean, and properly put away when through with them. Any person nursing the sick

should always wash his hands before eating food and should keep himself clean. Use an apron or washable clothing where possible.

Application of Cold and Heat. This may be done by hot-water bottles, ice bags and compresses.

In using a *hot-water bottle* or bag, let the water be boiling, fill the bag only about half full, expel the air and screw the bag up tight. See that it does not leak. Dry it outside and wrap a towel or cloth around it, and place where desired. *Take great care not to burn the patient*, especially if he is unconscious or delirious. To guard against this, let the nurse test the temperature of the bottle by holding it to his own face or arms. If a rubber bag is not available, ordinary bottles or cans may be used satisfactorily.

In using an ice bag, fill it with cracked ice, screw the cap on tight, wrap with a towel and place where desired. If necessary it may be held in place with a bandage. Do not use too continuously. Renew the ice as necessary.

Compresses have largely taken the place of the old-time poultices. They are cleaner and just as satisfactory. They are composed of heavy layers of gauze and cotton, or soft cloths, wrung out of hot or cold water as desired. Apply a heavy layer over the desired part and bandage in place. Or else, if some one is available to do it, they may be simply wrung out of water and laid over the part and renewed every few minutes. Where they are bandaged in place a piece of paraffined paper or oiled silk or something similar may be placed over them to keep them moist. Or they may be moistened in place every three or four hours. Or renewed as indicated. These compresses, if they are sterilized, may be placed directly over wounds, and are sometimes valuable in treatment when so used. They are then frequently called wet dressings. A hot-water bag may be placed over a compress where moist heat is desired.

Allied to the application of heat and cold are medicines which are applied to the skin to produce redness. Such as liniments, which are rubbed on, or tincture iodine which is painted on, or mustard plasters which are applied and allowed to remain a

while. These medicines when used in this way are called *counter-irritants*.

Liniments while they contain often substances which will red-
den the skin depend largely upon rubbing for their action. When
tincture iodine is used it must be painted on lightly and renewed
each day for about three days. It will burn badly if applied
too heavily or too often. Apply with a bit of cotton wrapped
around the end of a stick (wooden tongue blade). In using
mustard plasters it is best to buy them already prepared, although
they may be easily made by mixing well flour and mustard, about
one part of the mustard to three or four parts of flour, and
adding enough warm water to make a thick paste or dough.
Then spread on a piece of gauze, flatten out in thin layer, fold
the gauze over and apply, covered by a towel. Leave it in
place for about fifteen minutes. Too long will blister. Wash
the skin off after removal. Apply a little vaseline.

Enemas are often necessary. They are of many kinds. The
simplest and most useful is the soap-suds enema. To give this
use the fountain syringe. Several different hard rubber tips
come with each fountain syringe. Attach the short straight
tip with one hole, and then attach to that tip a short, soft rectal
tube. Prepare the enema by putting about one quart of warm
water in a clean basin or bucket and mixing with it enough
ordinary soap to make a good suds. Pour it in the syringe
after clamping off the tube. See that it flows through well
before using.

Let the patient lie down on his left side, knees drawn up and
elevated by a folded blanket or pillow. Cover the end of the
rectal tube with vaseline and insert it gently into the anus for
a distance of five or six or more inches. The soft rectal tube is
not always necessary and the hard rubber tip alone may be
inserted. A large rubber catheter may be used instead of the
rectal tube. Now elevate the syringe for two or three feet and
let the soap suds flow gently and slowly in. Raise or lower the
syringe as may be necessary. The patient should retain the
enema for fifteen or twenty minutes, if he can, before going to the
toilet.

The fountain syringe may be used in a similar manner to give *douches* of various kinds, to wash out wounds and for other purposes, provided the tip and the end of the rubber tubing is boiled before use, and the syringe itself washed out with scalding water or boiled. All rubber goods may be boiled if care is used in the process. They should be covered with the water, when boiling.

Bathing. Baths are given simply for cleanliness or to reduce fevers. It is always wise to keep the sick clean and their skins active. In giving a simple cleansing bath, remove the patient's shirt or pajamas, cover him with a blanket only, then with a soft rag or sponge and a basin of warm water and a little soap, uncover only part of the body at a time and bathe that part and dry it before taking the next part. First the head and face and then one arm and shoulder, then another and so on. Have him, if he is able, brush his teeth and rinse out his mouth. If he is not able himself to do this, it should be done for him with a piece of clean gauze wrapped around the nurse's finger.

Sponge baths are given when the fever is 103° Fahrenheit or over. In giving a sponge bath for reducing temperature, the procedure is different. The patient is stripped and covered with a blanket, as before. The bed must be protected with a rubber sheet. Have a large basin of clean, cold water at the bedside to which ice may be added when necessary. Also a small quantity of alcohol may be added to the water with advantage. Use a large soft cloth or a quantity of gauze. Uncover the upper part of the body and with hands and cloth dipped in water rub gently and firmly several times over all the exposed part of the patient's body. Next uncover the lower part of his body and do the same. Then turn him over and repeat the process. If the room is fairly warm the blanket may be dispensed with. The patient is then dried, removing the rubber sheet, and a blanket or other covering thrown over him. Leave him quiet for half an hour or so before putting back his night shirt. This sort of bath may be repeated every four hours, if necessary. The patient's temperature should be taken before and after bath to see the effect.

Swabs are useful for many purposes. They may be large or small. Make them by splitting a wooden tongue blade in two. Wrap carefully around one end, by a twisting motion, some clean absorbent cotton until the swab is the right size. They may be used for cleaning out the patient's mouth, swabbing the throat, cleaning ulcers and wounds, applying tincture iodine and other medicines, etc. Always use a fresh one and see that used ones are destroyed or thrown overboard.

Medical Diseases and Conditions. Treatment

There is a difference between symptoms and diseases. The symptoms are what the patient complains of and they indicate to the doctor what disease he may be suffering from. Sometimes we treat simply the symptoms. For example a man may have a vomiting spell which may be a symptom of some oncoming disease or may simply mean that his stomach is a little upset. We treat the vomiting and then wait to see whether anything else will happen. Sometimes such symptoms may be real medical emergencies when something must be immediately done to save the patient's life. Some of these conditions and emergencies as well as diseases are described below.

Chill and Fever

This may mean malaria or some other disease, or may simply occur from some cause with no after-effect. The chill may be mild or severe, and the patient may get blue and shake with cold. Put him to bed, give warm drinks, cover with blankets and use hot-water bottles. When the fever comes on remove the blankets and hot-water bottles. Keep him in bed on light diet, move his bowels and await events. Quinine may be given.

Pain

Pain is a common complaint and may mean many things. Something must be done for relief. It is not always easy to

tell how much pain a patient may have since some people are more sensitive to pain than others. Never give opium and morphine for pain if you can avoid it.

Always try other things first, unless the patient is in very great pain. Use hot and cold applications, rest in bed, apply mustard plasters, etc.

Inflammations

Inflammation may occur anywhere in the body. When it is due to surgical conditions, like a developing abscess, it will require surgical treatment, but many times other measures of relief may be tried. Inflammation is indicated by *redness*, *heat*, *swelling*, and *pain*. Hot and cold applications often give great relief. Either may be used according to which gives the most relief to the patient. Rest is also good treatment, whether it be general rest in bed or local rest for an arm or leg by keeping it quiet and not using it. Sometimes elevation of the part, like an arm or leg is of great help, such as resting the leg on a chair propped up on pillows. Inflammation is frequently only a symptom and indicates some trouble which time will show.

Nausea and Vomiting

This may indicate the beginning of some disease or simply be due to an upset stomach. It is always well for the patient to vomit until his stomach is empty. This gets rid of food which is not agreeing with him. Let him lie down and keep quiet. Give small quantities of cold water or ice. Stop all food. Put a small mustard plaster over his stomach just below the ribs. As soon as he can take it, give him a purgative.

Fainting

This may be a symptom of some disease or due to some other cause. The patient may simply feel weak and faint or he may

lose consciousness. His face will grow pale, the pupils of his eyes will dilate, and he usually falls unconscious. Always let such patients lie down flat, and elevate feet and lower part of body. Let them lie where they fall for a while before moving. If the patient does not soon react, bathe the face with a little cold water. Feel the pulse and see if it is good. As soon as possible remove the patient to bed, carrying him. Do not let him walk. Keep the head low. Do not give any unconscious person anything by mouth.

Convulsions (Fits)

The most common cause of this in adults is probably epilepsy, but fits may occur from other causes too. No epileptic should ever be shipped. But unless a man is seen in a fit one can not tell whether he is an epileptic. When a man has a fit everything should be done to prevent his injuring himself. Usually the patient utters a cry, his arms, legs and body begin to jerk and he falls, sometimes he froths at the mouth and he is likely to bite his tongue. He may fall overboard or down a hatch or companionway and be badly hurt. Stuff a rolled up handkerchief, or end of a towel or a soft piece of wood in his mouth to keep him from biting his tongue. Let him lie flat where he is for a while, and then attend to his injuries. If he has one fit he may have another at any time, and he becomes useless as a member of the crew. He must be watched.

Mental Disturbances

Sick people are often delirious and not responsible. Persons differ in this respect. Some people easily become delirious with slight fever. Others must be very ill before becoming so. It is not always a serious symptom. It is more common at night than in the day time. Such patients must of course be protected or they may injure themselves or jump overboard or do other foolish things.

Then, of course, one of the crew or passengers may develop insanity on board, or come aboard insane. It is not always easy to tell insanity. Besides a great many people have peculiarities, indeed most all of us have, and it is not wise to think people crazy just because they are peculiar.

If a person becomes so peculiar that he can not get along on board with others and creates disturbance, something must be done with him. This means that he must be restrained in some way. But never be cruel in restraining people. It is not necessary. Very few crazy people try to hurt others purposely. If they do appear to try to hurt others it is usually due to the fact that their minds are so busy about themselves that they do not pay attention to others and so may accidentally hurt some one. The main thing is to try to keep them from injuring themselves and to see that they get food and general care because they will not look after themselves. In a person with delirium a sheet may often be tied over the chest and under the bed or bunk in such a way as to keep him in bed safely without injury.

Paralysis (Apoplexy)

Men of some age especially are prone to have small sudden hemorrhages in the brain. This results in immediate unconsciousness, as a rule, with paralysis of one side of the body and thick speech with perhaps difficulty in swallowing. Such patients may die at once, or remain unconscious for days, or they may react soon and remain paralyzed for a long while. They should be put to bed with head and upper body elevated, given a big dose of salts, fed lightly and kept quiet till they can be turned over to a doctor. Look after bowels and bladder. They may have to be catheterized.

Skin Rashes (Isolation)

On board ship the skin of all sick should be searched for rashes because most diseases with rashes are contagious, and

some of them are quarantinable. All patients who have rashes on the skin, especially when they have fever also, should be isolated and kept away from the rest of the crew. One man should be told off to look after them and he should wear a gown whenever he visits the sick (and keep it hanging at the door) and wash his hands well afterwards.

Whenever in doubt as to the contagiousness of a man's sickness, isolate him. It is so much easier to prevent new cases than it is to take care of others who will fall sick. And besides it saves lots of trouble at quarantine when the ship arrives in port.

Headache

Headache is a common condition requiring treatment. It is usually an indication of a poison in the system and is often due to poor bowel action. A headache may, however, be a sign of the beginning of an acute disease, for a great many acute, infectious diseases begin with a headache. Headache also occurs in kidney disease, in which case it usually exists day after day over a long period of time. It may also result from eye strain, in which case it can be relieved by properly fitted glasses.

Treatment.—The treatment of headache is: 1. Thorough cleaning out of the bowel by means of a cathartic. 2. Five or ten grains of aspirin. This dose may be repeated in one hour if the headache is not better. 3. Applications of cold (ice or cold cloths) to the head, especially in headache caused by fever.

Backache

Backache may result from strain due to heavy lifting; from old venereal disease (gonorrhea) which sometimes affects the spine; from an approaching attack of some severe disease, such as smallpox, which is usually preceded for two or three days by very severe backache and headache; or it may be

lumbago, which is simply a very painful condition of the muscles of the back. The treatment consists of: 1. Hot applications and a thorough rubbing with liniment. 2. Small doses of aspirin, 10 grains every three or four hours. 3. A cathartic.

Toothache

Toothache is usually due to exposure of the nerve due to decay or pressure of pus on the nerve of a decayed tooth. Treatment, designed only to relieve the pain for the time, consists in using on the exposed nerve some substance which will anesthetize it. A very small amount of cotton saturated with pure carbolic acid inserted into a cavity in a tooth will usually relieve the pain. Care should be taken to use a very small piece of cotton and not to drop the acid in the mouth. In case there is pus at the root of a tooth or an abscess forms, the pus must be gotten rid of, either by pulling the tooth or by lancing the abscess.

Cramps and Bellyache

Cramps and colic are usually due to indigestible or poisonous substances in the intestine, although abdominal pain is one of the common symptoms in such diseases as cholera, typhoid and dysentery. Abdominal pain is often accompanied by vomiting and diarrhea. The treatment is: 1. A thorough cleaning out by means of castor oil which will get rid of poisonous or indigestible substances. 2. Small amounts of hot drinks by mouth. 3. A thorough washing out of the bowels by means of an injection of soapy water. 4. Hot applications over the abdomen.

Diarrhea

Diarrhea, except when due to an acute infectious disease, is nature's method of getting rid of putrefying matter in the intestines. The treatment is: 1. A thorough cleaning out by means of castor oil which will rapidly work off all the irritating matter in the bowel. 2. Doses of one quarter level teaspoonful

of bismuth powder every four hours. 3. Small doses of laudanum, if necessary (five to ten drops), to stop cramping after the cathartic has accomplished its work. 4. Very light diet or fluids by mouth for two or three days. 5. Rest in bed, if severe.

Rheumatism

Rheumatism, or pains in the joints and muscles, is usually due to the growth of germs in the joints. The swelling which occurs around a joint is nature's method of pulling the bones apart to stop pain. The treatment of painful and swollen joints consists in: 1. Thorough rubbing with liniment. 2. Bandaging with warm flannel. 3. Aspirin in doses of 15 grains four times a day. 4. Thorough cleaning out of the bowels, preferably by the use of salts. Long persistent rheumatism with swollen joints may be due to gonorrhea of these joints. For this condition, aspirin, etc., will do very little good except to partially relieve the pain.

GENERAL TREATMENT OF FEVERS

In the treatment of any type of fever, the patient should be promptly removed from his quarters and placed by himself in the sick bay, or in the best available place separate from the rest of the crew, since it is impossible to tell during the early stages, whether the disease is "catching" or not. An attendant or fellow member of the crew should be assigned to look after him.

In the treatment of any variety of fever, the first indication is a thorough cleaning out of the bowels. This may be accomplished by the use of oil, salts or pills. The patient should be put to bed and carefully kept there until his temperature is again normal. The attendant should be instructed to carefully wash his hands after handling the patient or his discharges or anything which has been used by the patient, and should always wear a gown or washable clothes, in order that he may not himself develop the disease.

All secretions (stool, urine, sputum or nasal secretions), from the patient, should be carefully sterilized either by boiling or by treating with 2 per cent. solution of cresol for an hour before being thrown overboard. The sick bay should be as quiet as possible and should be well lighted and ventilated and should be kept free from dirt and vermin. The food, for all fever patients, should be light and nourishing and should be as palatable as it is possible to make it, since a sick man's appetite is not as robust as that of a well man. The food should consist largely of broths, soups, milk (fresh or condensed), eggs, toast, boiled rice, custards and similar substances. The patient should be allowed all the fluid he desires. Usually, lemonade or drinks made of acid fruits are grateful to the patient.

Frequent sponge baths are indicated. Nothing will reduce a fever as well as a sponge bath of cool or tepid water. It may be necessary to give a sponge bath every hour or two to keep the temperature down. An ice bag placed on the head will be extremely grateful, and will reduce the headache which usually accompanies fever.

Care should be taken to keep the mouth (tongue and teeth) clean, especially where the patient is so ill that he is unable to help himself. Frequently, in these cases, the mouth becomes very nasty. It should be cleansed with a mouth wash made up by dissolving an alkaline antiseptic tablet in two or three ounces of water. The teeth should be brushed carefully at least twice a day, preferably more often.

The bowels should be made to move at least once a day. If necessary, for this purpose, a soap suds injection should be given or a cathartic administered by mouth. No very ill patient should ever be allowed to get out of bed for the purpose of moving his bowels or emptying his bladder, but rather in these cases a bed pan and urinal should be used.

The bed should be of sufficient length and breadth to be comfortable, and should have a firm, even mattress. Great care must be taken in the case of patients who lie in bed over a considerable period of time to see that they do not develop bed sores, which are sores due to pressure on one spot from lying in

bed for a long period of time. These can be avoided by carefully rubbing the skin over the back and sides of the hips with alcohol and then dusting with talcum several times a day. Care should be taken to see that the mattress is protected by means of a rubber sheet and that this and the sheet or blanket, upon which the patient lies, is drawn smooth, since wrinkles in the mattress or coverings are uncomfortable and may help to cause bed sores.

Typhoid Fever

Typhoid fever is an acute, infectious disease which is caused by drinking water containing typhoid germs or by taking into the mouth substances containing these germs. Typhoid germs always come from the intestine of some one who is or has been ill with this disease. Typhoid is characterized by a severe, prolonged illness and results in death in about 10 per cent. of persons having the disease. It frequently begins with a headache, sleepiness, etc., for a period of a week or more before the actual onset of the fever. The fever is high and continuous, remaining with very little variation at about 103 to 104 degrees, morning and evening, for four or five weeks, then drops slowly, leaving the patient in an extremely weakened condition. During the early stage of the fever, the appetite is lost and the patient has no desire for food through practically the whole course of the disease. The mouth, due to the fever, gets in an extremely bad condition, the tongue and teeth being covered by a thick gummy material which is difficult to remove. Very often, the patient becomes delirious or goes into a stupor. During practically the whole course of the disease, the stools are of a yellowish, green character, very thin, slimy and very offensive. One of the complications of the disease which is most feared is bleeding into the bowel. This blood may be bright red if fresh, or black in color if it is older. During the early stage of the disease, there is a breaking out over the belly and chest, consisting of small, reddish points, usually about a dozen in number, which disappear on pressure.

Treatment.—The treatment of the disease consists in putting the patient to bed and keeping him there as nearly as possible on fluid diet. He may be given all the water he desires, milk (malted or fresh), strained soups and other similar fluid foods. Nourishment should be given in small amounts, frequently repeated (every two or three hours). For the fever, cool baths are best, and tend to reduce the temperature and make the patient feel better. No medicine is necessary, except possibly a preliminary dose of castor oil, nor does medicine do any particular good. The directions for the general care of fevers should be followed. To prevent others developing the disease, clothes, eating or drinking utensils or other things of this type, used by the patient, must be sterilized by boiling. The stools and urine should be disinfected by adding chloride of lime or mixing equal parts of stool and 2 per cent. solution of cresol or 5 per cent. solution of carbolic acid, letting them stand for an hour, by which time they will be disinfected and will do no harm if thrown overboard. Even after the appetite returns, which is at the end of about five to seven weeks, it is best to keep the patient on very soft diet for at least two or three weeks longer, as there is danger of rupturing the bowel if heavy foods are taken.

Malaria

Malaria is a disease caused by a tiny animal which gets into the blood, through the bite of the *Anopheles* mosquito, and develops there, giving rise to thousands of similar animals. These cause the chills, fever and sweats which follow one another in regular order and which is the typical picture of this disease. An attack of malaria may be sudden or may be preceded by headache and sometimes by vomiting. It usually starts with a chill which may be of any degree of severity; sometimes only a chilly feeling. Usually, however, the chill is well marked, the teeth chatter and the whole body shakes. The chill may last from a few minutes to an hour. As the chill subsides, it is succeeded by the hot stage. The face becomes flushed, the pulse full and pounding, the head aches and the

patient has a high fever. This stage lasts from a half hour to four or five hours, when a sweat occurs, with the gradual disappearance of the fever, headache and other symptoms. Following this, the patient usually falls into a refreshing sleep. The sweating stage ordinarily lasts from one to three hours. At the end of the sweating stage, the patient may feel quite fatigued or may feel well and able to be up and about until the beginning of the next attack, at the end of 24, 48 or 72 hours.

Pernicious malarial fever is a very fatal disease which occurs chiefly in hot climates. The patient may be taken suddenly with headache, high fever, and delirium, and may rapidly pass into unconsciousness. Death may occur within a few hours of the beginning of the attack. In severe malaria, hemorrhage from the gums and mucous membranes sometimes occur, even the urine sometimes containing blood.

Treatment.—The treatment of malaria consists in giving quinine. Quinine should be given in acute malaria in doses of fifteen or twenty grains by mouth three times a day, and, as the symptoms grow less, this dose is reduced to ten grains once a day. When in a malarious country, or a country which is known to have malaria in it at all times, it is a safe rule to take five grains of quinine once a day as a means of prevention. Quinine in this amount will prevent the development of malaria. The quinine should be begun, however, a week before arriving at a port in which malaria is known to exist.

The headache in malaria may be relieved by cold applications. In cases of collapse, hot stimulating drinks should be given. For extreme pain or restlessness, ten to fifteen drops of tincture of opium should be given. Free purgation should be maintained during the treatment of malaria. If there is much vomiting, and the quinine cannot be retained on the stomach, it may be given by rectum, by first washing out the rectum and then injecting into the rectum forty or fifty grains of quinine in two ounces of water. Quinine is the remedy for any form of malaria fever. If the fever does not yield to quinine, it is safe to assume that it is not malaria.

Frequently, men who have had malaria and who come from

a hot climate into a temperate or cold climate, have an attack of chills and fever. In this case, they should immediately take quinine, just as in an acute attack of the disease.

Typhus Fever

(Ship Fever; Prison Fever)

Typhus fever is an acute, infectious disease which is transmitted by the bite of the louse. The prevention of this disease depends upon the eradication of lice from the clothes and from the body. This should be done by fumigation of the clothes by means of sulphur fumes or their disinfection by flowing steam. The lice and nits in the hair may be destroyed by kerosene or by washing with 1-2000 bichloride solution. In attending a typhus patient, particular care should be taken not to become infested with lice. The incubation period of the disease is from five to fifteen days. It usually begins suddenly with chills, fever, headache, pain in legs, mental dullness and vomiting. There is a breaking out which appears within two or three days. This eruption consists of a pale reddish rash under the skin. The fever usually is about 102 or 103 and lasts from two to three weeks.

The treatment consists of that for the general care of all fever patients, plus extra care to prevent spreading of the disease by lice from the patient to others.

Bubonic Plague

Bubonic plague is a disease which is so named because of the fact that one of its chief symptoms is the formation of buboes or swelling of the glands, usually in the arm pits or groins. The disease follows the bite of the rat flea which may carry plague germs in its body and in biting inject them into the human body.

There are two other forms of plague, one known as septicemic plague, which is practically always fatal and in which the patient dies before buboes have time to develop; and another

type, known as the pneumonic plague or plague pneumonia. Plague pneumonia is practically always fatal.

In bubonic plague, buboes develop in about 75 per cent. of all the cases. These are chiefly in the groins but also occur in the arm pit and neck. The swellings vary in size from a marble to a goose egg and are as a rule very painful, being very much more painful than a bubo due to venereal disease. The germs causing the disease are found in the buboes and blood of the patient, and in addition to being injected by a flea bite, may enter the body through small cuts or injuries to the skin. Plague is practically always carried by rats, and in most epidemics, plague is preceded by wholesale deaths among the rats.

Symptoms.—The incubation period of plague is two to five days. Most cases of bubonic plague begin suddenly with fever which may or may not be preceded by a chill. The temperature rises rapidly to 105 or 106 degrees on the second or third day. The pulse at first, full and bounding, soon becomes weak, the beats varying from 100 to 150 or more per minute. The tongue becomes dry and brown in color, and delirium or coma may set in. The patient is usually exceedingly ill and may die in this early stage, before the buboes develop. Most cases of plague that die, die within the first six days. In those cases of plague which do recover, there is a very slow but very gradual improvement. At the site of the bubo, there is usually left an indolent sore which is very slow to heal.

Treatment.—Should plague develop, the patient should be immediately separated from the rest of the crew and placed in a clean well ventilated compartment. Articles of clothing or bedding soiled by the discharges of the patient should be burned, disinfected by steam or by boiling. All rats and vermin of every kind should as far as possible be destroyed. Discharges from the patient, urine, stool, vomit or sputum, should be passed into a solution of cresol, carbolic acid, or chloride of lime and allowed to stand until disinfected. All articles brought into contact with the patient should be disinfected. A preliminary cathartic should be given when the patient is first taken ill. Stimulants, i.e., hot coffee or strychnine sulphate, grains $\frac{1}{30}$, should be given

every three or four hours from the beginning. Ice or cold water should be applied to the head to relieve the aching. To reduce the temperature, the body may be sponged with cold or tepid water. After the buboes soften, they should be incised and dressed. Pain and restlessness may be relieved by tincture of opium, drops 15, by mouth or by $\frac{1}{4}$ grain of morphine. The ship should be taken to the nearest quarantine station for thorough fumigation in order to kill all rats.

Cholera

Cholera is an acute, infectious disease, which is caused by the swallowing of a germ called the cholera germ. This disease is transmitted from person to person through contamination of drinking water or food with the germs of cholera, from some one sick with this disease. The presence of cholera means that food or drinking water have been used which contained the germs of cholera, discharged in the stool of a patient having this disease. Since the disease is transmitted in this way, exceptional care should be taken during the existence of cholera to thoroughly disinfect by cooking, all foods, and to drink only water that has been boiled. The hands of those coming in contact with cholera patients should be carefully washed after handling the patient, since they may become soiled with his discharges. The clothing of the attendant should be covered by a gown or other cover which can be disinfected if soiled.

Cholera has an incubation period of from two to five days. The disease may be of any degree of severity, sometimes consisting of only a rather severe diarrhea with colicky pains, purging and vomiting, or it may be an extremely severe condition. In most cases, cholera begins with a looseness of the bowels or a simple diarrhea, which becomes more violent in the severe cases within an hour, or others within a day. The stools soon lose their yellowish color and appear grayish white. From their appearance they are known as "rice water stools," and are typical of the disease. The diarrhea is accompanied by vomiting. There is a burning sensation in the stomach and an

unquenchable thirst. Severe cramps occur in the feet and calves of the legs and sometimes in the hands and arms. There is usually no excretion of urine, as the fluids of the body all flow into the stomach and bowel and large amounts of fluids may gush from the mouth as well as from the rectum. The skin becomes cold and clammy and covered with sweat and the patient extremely weak. The tongue is heavily coated and cold to the touch and the patient sinks into a condition of collapse. During this time, the temperature may fall to five or six degrees below normal. The mind usually remains clear until near the end.

In the most severe forms of cholera, the patient may go into collapse within an hour of the beginning of the attack. In the milder form in which the patient survives the collapse, the symptoms gradually subside, the skin becomes warmer, the pulse stronger, the urine is again passed, the stools become more natural, and eventually, the patient recovers.

Treatment.—During the prevalence of cholera, or while in a port where cholera is occurring, all cases of diarrhea or irritable stomach should receive careful attention, as cholera usually begins with such symptoms. Rest in bed, fluid diet and clean surroundings must be insisted upon. The drinking water for all hands must be boiled. The patient should be carefully isolated and everything coming into contact with him or soiled by his discharges must be disinfected. The stools should be passed into a vessel and a 5 per cent. solution of carbolic acid or a 10 per cent. solution of chloride of lime added in equal volume and allowed to stand one hour. All linen and bed clothes should be disinfected by steam or by boiling. Spoons, knives, plates and similar utensils should be boiled immediately after use. The medical treatment consists in giving tincture of opium or morphine to check the cramps and diarrhea. During the stage of collapse, small amounts of alcohol and water, hot coffee and tea are valuable. Warm water should also be injected into the rectum very slowly from a long, soft rubber tube attached to a fountain syringe. This water is retained and absorbed. The patient should be wrapped in warm blankets and stimulated

and supported in every way. As the symptoms subside, the food may gradually be increased, relying largely on fluids for the first few days. A ship on which cholera breaks out should of course, go to the nearest quarantine station for treatment of the sick and thorough sterilization of water supplies, etc., in order that the disease may be checked.

Yellow Fever

Yellow fever is an acute, infectious disease, which occurs in warm climates. It is characterized by fever, yellowness of the skin and whites of the eyes, suppression of the urine, and bloody or black vomit. This disease is carried from person to person by the bite of a certain kind of mosquito known as the *Stegomyia fasciata*. So far as is known, the disease is transmitted in no other way except by the bite of this mosquito which has fed on some one sick with the disease. This disease is not carried by the discharges, or by articles which have come in contact with a patient ill with the disease, consequently, it is unnecessary to disinfect them. The only measure necessary to stop the spread of yellow fever is the destruction of mosquitoes, which can be accomplished by fumigation with sulphur or cyanide. Of equal importance, where it is impossible to destroy mosquitoes, is the protection of the person ill with the disease, from mosquitoes, in order that the mosquito may not bite this ill person and then carry the disease to some one else.

The incubation period of yellow fever is from two to five days. The disease begins suddenly, and usually, though not always, with a chill. The chill is followed by a moderate or high fever, 101 to 105 degrees, with a hot skin and rapid pulse (pulse about 100 to 120 per minute), flushed face and watery, red eyes. The tongue in the early stage of the disease is usually moist and coated but later becomes dry. There is a marked thirst, a sore throat and an irritable stomach, and, in most cases nausea and vomiting which begin early. The bowels are usually constipated, and the stools a dark color. The urine is very scant. The fever, during this first stage, may last from two to three days. During all the time the fever keeps

up, the pulse grows steadily slower. Death may take place during the first two or three days of the disease.

Usually, this first fever stage is followed by a second stage of calm, during which time the fever goes down and the symptoms subside. During this stage, there is usually yellowness of the eyes. In the milder cases, this is the beginning of recovery.

In the more severe cases, there is a third stage during which the temperature again rises. All the symptoms of the first stage recur with increased severity. The jaundice or yellowness of the skin and eyes increases. The pulse drops to 40 or even 30 beats to the minute. The vomiting increases. The vomited matter may contain blood, and then looks like coffee grounds. The patient complains of severe abdominal pains or cramps. The stools may be black and tarry. The urine is very scant. It is said that where black vomit sets in early, the disease is nearly always fatal.

Treatment.—If illness which is believed to be yellow fever appears after having visited a yellow fever port, the patient should be immediately isolated in a well screened, clean room and should be supplied with an attendant or nurse who has had the disease, if possible. A cathartic should be given early in the disease, preferably three to five grains of calomel, which should be followed by salts. For the vomiting, small pieces of ice in the patient's mouth and sips of cold fluids will aid materially. The bowels should be kept open, if necessary, by means of rectal injections of soapy water. For the high fever and restlessness, give five to ten grains of aspirin. The most important factors in the treatment of yellow fever are careful nursing, general care, and the diet. The diet should consist only of fluids of the thinnest and most easily digested character.

The chief problem is the destruction of mosquitoes in order that the disease may not be carried from one member of the crew to another. All collections of water, barrels, buckets, etc., should be protected by netting or should be oiled to kill wigglers and the ship should be taken to quarantine as soon as possible, in order that thorough fumigation may be carried out for the destruction of mosquitoes.

Smallpox

Smallpox is an infectious disease characterized by fever and a typical eruption on the body. This disease spreads rapidly among persons not protected by vaccination, and is carried, so far as is known, by direct contact with the sick individual, or by the clothing or articles that have been in contact with him. It is extremely contagious during practically its whole course. The incubation period is from eight to fourteen days. The disease begins usually rather suddenly with a chill, a severe pain in the back, an intense headache, and a high fever. The eruption appears about the third or fourth day after the beginning of the backache, headache, etc., and appears as hard pimples very firm to the touch, bright red in color, usually beginning on the forehead, wrists and about the lips. This first eruption is called the papular stage and each spot feels very much like a shot under the skin. As soon as the eruption breaks out, the temperature begins to fall and the patient feels very much better. On about the fifth or sixth day, a small blister filled with straw colored fluid appears on the top of each papule. Each blister or vesicle, as it is called, has a depression in the center, which is characteristic of the eruption of smallpox. In about eight or nine days, the fluid in these blisters changes to pus. At this time, each spot is known as a pustule. Each pustule has a yellowish gray appearance and is surrounded by a red area. The skin between them becomes swollen and the eyes may be swollen shut. At this time, the temperature rises again and the patient becomes very ill. After a day or two, the pustules break and crusts form, first on the face and then over other parts of the body. The crusts dry and fall off, leaving red spots on the skin with here and there a characteristic pit or pockmark. In a very severe form of smallpox, known as confluent smallpox, the eruption appears very much closer together, the swelling is more marked and the features are distorted. Severe delirium and death may occur on the ninth or tenth day or even earlier. Another still more severe form of smallpox is known as bloody smallpox. In this form, in place of having the characteristic eruption, blood blisters

appear under the skin, there is bleeding from the nose, mouth and rectum, and the patient usually dies before there is a typical eruption and pustule formation.

Where crusts form, they begin to drop off about the fourteenth or fifteenth day, but this process is not complete until about the end of the fourth week, and during all this time, the disease is "catching." A very much milder form of smallpox occasionally occurs among those who have been vaccinated.

Treatment.—The patient should be placed in a cool, well ventilated room and strictly isolated. The attendant in care of the patient should be one who has had smallpox or is known to have had a recent successful vaccination. He should wear either a gown or some form of clothing which can be easily disinfected or can be destroyed afterward. The attendant should not be allowed to come in contact with other members of the crew. Separate dishes and utensils should be provided. The soiled clothing, etc., from the sick room should be either burned or thoroughly boiled or soaked for one hour or more in 1:1000 bichloride solution.

In the early stages of the disease, a cool sponge bath every three hours will relieve the patient somewhat if the temperature is high. A cathartic may be necessary. For the severe pain in the back and head, a morphine tablet, $\frac{1}{4}$ grain, by mouth, may be given and if necessary repeated in four hours. The food should be soft or fluid and given at regular intervals. Fluid, water, etc., should be given very freely.

Cold applications to the skin will relieve the pain and burning. When pus begins to form in the blisters, the top of each blister should be touched with a little tincture of iodine. After this, each pustule may be punctured by a sterilized needle. The hair should be cut short early in the disease, and when crusts begin to form, olive oil or vaseline should be applied to soften them. The eyes must be carefully cleaned with boric acid solution several times a day and the mouth and throat should be washed with alkaline antiseptic solution. The crusts, scabs, etc., should be carefully burned when they fall off and the patient should have a careful daily bath as soon as these crusts have

fallen off. Following the completion of a case of smallpox, every article in the room, including the room itself must be carefully disinfected either by burning sulphur, five pounds to every 1000 cubic feet of air space, or by a double fumigation with formaldehyd, followed by a thorough, prolonged airing. If anyone on board breaks out with smallpox, the ship should be immediately taken to the nearest quarantine station.

Of greater importance than the treatment of the disease, is the prevention of smallpox. Smallpox can practically always be prevented by thorough vaccination. Even after the disease breaks out, if vaccination is immediately carried out on all individuals, smallpox will not spread. (For method of vaccination, see page 27.)

Pneumonia

Pneumonia, or inflammation of the lungs, is an acute infectious disease which is likely to follow prolonged exposure, injury to the chest, or reduction in vitality, if the individual is exposed to the disease or carries germs of the disease in his nose or throat. It is very mildly "catching." It is a highly fatal disease for which very little can be done in a medical way, except the general care given all fevers. The disease may begin as an ordinary cold which extends into the lungs or it may have a sudden onset, beginning with a very sharp pain in the chest, and with rapidly increasing fever, the temperature mounting rapidly to 103 or 104. The sputum in the early stages of the disease usually contains some bright blood, which later changes to a rust color and gives the characteristic appearance of pneumonia sputum, so called "prune juice sputum." The fever is usually continuous for from five days to two weeks. There is sometimes delirium from this fever. The breath is usually taken in short, sharp gasps (from 40 to 60 to the minute). Each breath is commonly accompanied by a short cough or grunt. The great danger in pneumonia is failure of the heart. When the fever ends, it usually ends abruptly, falling to normal within twelve hours, although the patient will be weak and ill for several days after the temperature drops.

Treatment.—The treatment in pneumonia consists in keeping the patient in bed in a cool, well ventilated place, with careful nursing, and plenty of light, nutritious food. Small doses of cough mixture or codein may be given to relieve the cough. For the severe pain in the chest, especially in the beginning of the disease, a small dose of morphine by mouth is necessary. In case of heart failure, as shown by rapid weakened pulse, strychnine should be given either by mouth or hypodermically. Hot coffee or tea, which contain the stimulant caffen, are also valuable. Pneumonia frequently leaves the heart considerably weakened, so that the patient may be unable to do heavy work for several weeks after he is able to be up and about.

Influenza

Influenza is an acute, infectious disease which usually starts like a severe cold. It is a respiratory disease and is transmitted from one to another by the breath and by discharges from the nose and throat. The patient often becomes very ill in a few hours, with a fever, rapid pulse and often severe chills. He usually feels much more ill than his fever, pulse, etc., would indicate. The most feared complication in influenza, is the development of pneumonia, which is rapidly fatal in a large proportion of cases. The disease lasts usually from three days to a week, although with true influenza, the patient feels ill and weak for a very considerable period of time after this.

Treatment.—The treatment of this condition, as of all fevers, is to put the patient to bed and keep him there on a light diet. A cathartic should be given in the early stage, if necessary, to move the bowels thoroughly. Medicines do very little, if any good. Small doses of aspirin, five to ten grains, relieve the pain and aching which accompanies this disease. Influenza patients should be isolated from the rest of the crew and the discharges, especially from the nose and throat, be carefully disinfected.

Tuberculosis

Tuberculosis, or consumption, is an infectious and very much dreaded disease which kills many sailors each year. Seamen seem to be especially liable to develop tuberculosis, primarily, because they are so closely housed with one another in the restricted limits of shipboard, very often without proper precautions in the matter of ventilation. Tuberculosis is a disease which affects the lungs, causing them to become solid in parts and eventually to develop cavities in the center of these solid patches. The prevention of tuberculosis is comparatively simple, if proper precautions were observed, since the disease is spread from person to person by coughing or expectorating. The droplets of sputum which fly through the air during a coughing spell and the matter brought up from the lungs of a tuberculous person, may contain thousands of the germs of tuberculosis. If these are breathed into the lungs of a healthy individual, he in turn is liable to develop tuberculosis. The prevention of the disease consists in the isolation of all persons suffering from tuberculosis, or since this is not possible by having them cough into a kerchief and spit in containers that can be burned or sterilized, and not where the sputum is liable to dry and be blown about to be breathed in by others.

Tuberculosis may develop in anyone, even a person not known to have been exposed to the disease, as the result of overwork, loss of sleep, dissipation or underfeeding. Men who neglect themselves, who do not clothe themselves properly, and do not treat themselves for small sicknesses may develop tuberculosis. No man is so healthy or so strong that he may not fall sick with tuberculosis. The well fed, well clothed man who gets sufficient sleep, and is not afraid of fresh air seldom develops tuberculosis. The following are common symptoms of the disease:

Loss of strength.

Loss of appetite.

Loss of weight.

Rapid heart beat.

Shortness of breath.

Fever in afternoon.

Cough or hoarseness.

Night sweats.

Pain in chest.

Coughing up blood.

Early cases of tuberculosis are nearly always cured. Late cases of tuberculosis nearly always die. A healthy man should have his lungs examined by a physician at least once a year for disease just as his teeth should be frequently examined by a dentist. The local Public Health Service officer will examine any man who comes to him. Sometimes it is easy to determine whether the man is tuberculous or is healthy and a simple examination of the bare chest is enough. Sometimes however, an X-ray examination or observation in hospital for two or three days is necessary. Usually the sputum must be examined under a microscope. If a seaman has tuberculosis the Government will send him to one of its special tuberculosis sanatoriums where, if the disease is in an early stage, he can be entirely cured.

Symptoms.—In the beginning of the disease, there is usually a slight loss of weight, together with a little fever, especially late in the afternoon. There may or may not be during the early stages of the disease, a slight hacking cough. This cough continues week after week. Often, there is considerable sputum coughed up from the lungs which may contain blood streaks. The fever is not high, going up to 100 or even 102 in the afternoon, usually being near normal in the morning. There is a progressive loss in weight. At any stage of the disease, there may be a hemorrhage from the lungs.

Treatment.—Very little medical treatment can be carried out aboard ship. This disease is chronic in nature, and it will usually be possible to get the patient to shore and to a hospital in sufficient time for treatment there. In the meantime, in a known case of tuberculosis, keep the patient in bed and feed him as liberally as possible with as nourishing food as can be secured. In case of hemorrhage, put the patient to bed and at absolute rest, give small pieces of cracked ice which should be put in the patient's mouth and should be swallowed. He should be given morphine, $\frac{1}{4}$ grain, by hypodermic. This will usually control the bleeding, providing the patient is kept quiet.

Occasionally, a man with active tuberculosis is shipped, though this is a dangerous procedure. When he is shipped, he should

be forced to do his coughing into a rag or kerchief which must then be burned. Spitting on the decks or on the floor of the quarters or cabins should not be allowed. Cuspidors should be furnished, which can be readily cleaned or destroyed with the contents. If a case of tuberculosis is suspected the patient should be examined for the disease as soon as possible by a physician, and in the meantime should be warned against coughing except into a rag or kerchief and should not be allowed to sleep in the general quarters if any other arrangement is possible.

Trachoma

Trachoma, or chronic inflammation of the eye, is a disease affecting chiefly the eyelids in the early stages, but later the eye itself. If not treated, it causes scarring of the eyeball with subsequent blindness. This disease is transmitted from person to person by means of the discharge from the eyes. On this account, common towels, sweat rags, etc., may cause the spread of trachoma if there is a case aboard ship. Care should be taken to see that any member of the crew with sore eyes has his own towels, sweat rags, etc., and keeps them to himself. He should consult a physician at the earliest opportunity. The treatment of this disease is a matter of months and can only be carried out by a physician.

Dysentery

Dysentery or, as it is sometimes called, bloody flux, consists of a severe inflammation of the mucous membrane lining the bowel. There are two varieties, both occurring more commonly in tropical and semi-tropical countries. The most common of these forms is amebic dysentery, which is caused by a germ which is taken into the system with drinking water or in food.

Symptoms.—The disease begins very much like ordinary diarrhea, with possibly a slight chill and fever. After a day or two, the diarrheal stool is replaced by a stool consisting

largely of mucus, which may be mixed with blood. The diarrhea is accompanied by a constant desire to move the bowels and more or less cramp and colic. The stools may number from ten to thirty in a day, though the quantity of each stool is very small. In amebic dysentery, abscess of the liver is a common complication.

Treatment.—A patient with dysentery should be put to bed and given a thorough cleaning out by means of castor oil. Following this, it will probably be necessary to give either morphine or tincture of opium to stop the cramping. Ipecac, which is carried in the medicine chest, is almost a specific for amebic diarrhea. Ipecac (Alcresta) should be given in doses of 10 to 15 grains, three times a day. The food should consist largely of fluids and of the most easily digested substances in order to prevent further irritation of the bowel. As soon as possible, the patient should be taken to port and to a physician, as more vigorous treatment than this is needed to do away with the infection.

Erysipelas

Erysipelas is an acute inflammation of the skin. The disease is sometimes known as St. Anthony's fire. It usually begins on the face, more commonly over the bridge of the nose, as a small red spot rapidly growing in size until it spreads over the whole of the face, ears and scalp, and occasionally down the back and chest. The skin is painful, red, hot and swollen. Blisters frequently form. The eyes usually swell shut. The patient's face is so distorted as to be unrecognizable. The disease runs its course in from a few days to a week. Frequently, in those individuals addicted to alcohol, delirium will develop. Erysipelas is contagious only in that it may be the cause of infection in a wound or scratch on the body of a person caring for a patient having this disease.

Treatment.—The disease runs its course uninfluenced by treatment. Cold water as an application is probably as good as anything that can be used, as it brings marked relief to the

swollen and burning skin. Cloths saturated with cold water should be placed over the inflamed areas and changed frequently. A thorough cleaning out of the bowels is indicated. The disease runs its course usually in about a week.

Tonsillitis

Tonsillitis is an acute, sore throat and is a very common condition. It often follows exposure to wet and cold. The tonsils, and very often the whole of the throat, become covered by whitish-yellow patches. This inflammation is often accompanied by a high fever and chills. Frequently, an abscess develops beneath the tonsil which, if not opened by means of a knife, goes on to rupture.

Treatment.—The treatment consists in the use of a gargle of alkaline antiseptic solution or ordinary baking soda, one teaspoonful to the glass. Cold applications to the throat will relieve the pain. The treatment should be started by a thorough cleaning out of the bowel. Persons subject to attacks of tonsillitis should have their tonsils removed by a physician at the earliest opportunity.

Venereal Disease

There are three ordinary forms of venereal disease:—Gonorrhea, or clap; syphilis, great pox or chancre; and chancreoid, or soft chancre. These diseases are contracted usually through sexual intercourse.

Gonorrhea

Gonorrhea consists of an acute inflammation of the water passage, together with a discharge of pus which begins in from three to seven days after intercourse. In the beginning there is a burning and stinging pain, which occurs on attempting to pass water. This inflammation continues to become more severe up to about the end of the third week. By that time there is often great difficulty in passing water, and a great deal

of pain experienced at night from involuntary erections (chordee). Accompanying the inflammation of the water passage, there may be a swelling of the testicles and of the glands in the groins (buboes). The chief danger of this disease on shipboard is that the disease may be spread to the eyes of others through soiling of common towels or other articles of this type. A patient having gonorrhea should be cautioned to use none but his own towels and to wash his hands carefully each time his fingers become soiled with the discharge. The disease runs its acute course in from three to six weeks, gradually subsiding and leaving a chronic, very slightly purulent discharge.

Treatment.—The treatment consists in a preliminary cathartic; drinking plenty of water to which a small amount of Eaking soda should be added for the purpose of making the urine bland; light diet without much spice or pepper; frequent bathing and, during the acute stage of the disease, capsules of copaiba and santol oil, one or two, three times a day. These capsules have no curative effect but will relieve the pain. As the discharge becomes less, injections 1 : 2000 potassium permanganate solution, three or four times a day tend to dry up the discharge. As soon as possible, the patient should go to a physician for continuation of his treatment. For the painful erections (chordee), bromides in doses of thirty to fifty grains at night will relieve the condition, as well as cold applications (either cracked ice or cloths rung out of cold water). For swollen testicles, rest in bed and a suspensory bandage with a liberal application of ichthyol ointment will relieve the condition.

Syphilis

Syphilis is not a local but is a general constitutional disease, which is usually contracted through intercourse. During the first stage, it consists of a single ulcer or chancre, which appears anywhere from ten days to six weeks after exposure. After a varying period of time, from one to six weeks after the appearance of the first sore, there is a general breaking out over the whole body. Sores appear in the mouth, on the lips and tongue,

and sore throat is common. The hair frequently falls out and syphilitic warts may appear about the anus, under the arms or in any location where the skin is constantly moist. During this, the second stage, the disease is most dangerous to others, since the use of cups, knives, forks or other utensils of this sort by one having syphilitic sore mouth may cause the development of the disease in some one else who uses these articles. Persons suffering from syphilis should be forced to have and use their own eating and drinking utensils and keep them separate from those of others, as well as to use their own towels, sweat rags, etc.

Treatment.—For the primary sore, the parts should be bathed with soap and water twice a day and dusted with calomel powder. The treatment during the second stage consists of careful rubbing into the skin, once each day, a small amount (a piece the size of a small bean) of mercury ointment. During the use of mercury, the teeth and gums must be carefully watched and should be brushed each day with a soft toothbrush and tincture of myrrh. As soon as possible, a physician should be consulted in order that proper treatment may be administered. The treatment of syphilis is not a matter of a week or a month, but is a matter of months or years, and treatment should not be discontinued until the doctor can find no more symptoms of the disease by ordinary examination or by the blood test.

Chancroid

Chancroid, or soft chancre, is a local ulcer which usually begins within two or three days after exposure. The ulcer is very much more severe than that of syphilis and spreads rapidly, very often causing the formation of three or four more ulcers. It is accompanied by the formation of buboes or abscesses in the glands of the groins. It is difficult to tell whether an ulcer is a hard or soft chancre, and the only safe procedure is to consult a physician as soon as possible.

Treatment.—The treatment consists of thoroughly washing

with soap and water, cauterization once, by means of a small amount of pure carbolic acid on the end of a probe and dusting with calomel powder. In cauterizing with carbolic acid, be very careful not to spill the acid or to apply it any place other than the surface of the ulcer. A frequent washing with 1:2000 bichloride of mercury solution followed by calomel powder is very often beneficial. If abscesses form in the groins, it will be necessary to lance them. (See directions under surgical procedure, page 126.)

Itch (or Scabies)

This is a condition produced by a tiny insect which burrows into the skin, particularly between the fingers and toes. The itching from this disease is almost intolerable, and is usually worse at night. The disease is spread by personal contact, by clothing and by bedding.

Treatment.—Sulphur ointment is almost a specific for this disease. The body should be bathed thoroughly with soap and water, the skin dried and the ointment applied. The ointment should be applied for three successive days followed by a thorough bath and a complete change of clothes and bedding.

Heat Exhaustion

Heat exhaustion is a condition which must not be confused with sun stroke. It arises from long continued exposure to high temperatures, especially where the ventilation is poor, and may occur occasionally among men working in the stoke hold. The symptoms are fainting and collapse. The pulse becomes very rapid and feeble; the temperature falls below normal; the face becomes pale; the skin cold and clammy in spite of the heat to which the patient is subjected. The treatment consists of wrapping the patient in warm blankets, giving stimulants such as strychnin, tea or coffee, putting him to bed and allowing rest for several days.

Sun Stroke

Sun stroke is an entirely different condition from heat exhaustion. In sun stroke the patient has usually been exposed to the direct rays of the sun. He may become dizzy and fall or he may develop delirium. In heat stroke there is usually marked restlessness and activity for a time, followed by unconsciousness. The temperature is high, 106 or above; the skin hot and dry; the pulse usually full and bounding.

Treatment.—Note that it differs radically from heat exhaustion. Cool the patient as rapidly as possible by cold baths to which ice has been added. Apply ice to the head and spine and give cold drinks. When the temperature comes down to 100, discontinue cold. If it rises again, repeat the baths, etc.

Poisons

Poisons are substances which, when brought into contact with the tissues of the body, impair the health or destroy the life of these tissues.

For our purpose, we will deal with those substances which, when taken into the stomach, are said to cause poisoning. These may be vegetable poisons, mineral poisons, acids or alkalies. One other variety of poison with which we must deal is that from gas, such as sulphur or cyanide gas.

When irritant poisons are taken into the stomach, the signs of poisoning are similar no matter what the variety has been. The most common signs are vomiting and purging. When vomiting or purging occurs suddenly in a healthy person, it is fair to suppose that the condition is due to some poisoning, as this is nature's method of getting rid of it. In most cases of acute poisoning, the pulse becomes very rapid and feeble. The breathing is usually labored and difficult. The skin usually is extremely pale and cold. In the later stages of poisoning, unconsciousness, spasms or paralysis may occur.

Treatment.—When the poison has been taken by mouth,

the treatment of poisoning is to aid nature in getting rid of it. This is done by causing vomiting and by cleaning out the intestine as thoroughly and as rapidly as possible. Before the patient is made to vomit, large quantities of fluids should be drunk in order to dilute the poison. As vomiting occurs, this fluid will wash out any poison which may be in the stomach. If the poison has been an alkali, a weak acid, such as vinegar or lemon juice should be given to neutralize it. On the other hand, where poisoning is caused by an acid, weak alkalies, such as baking soda or lime water or a teaspoonful of wood ashes should be given, to neutralize the action of this acid. If the poison taken is a caustic, such as carbolic acid or bichloride, any albuminous substance, such as the white of an egg or milk should be given to neutralize it.

As soon as possible after these substances have been given, the stomach should be emptied. This can be accomplished by giving large draughts of warm salt water or weak mustard water (one teaspoonful of mustard to a pint of warm water) and then sticking the finger down the throat to cause vomiting. If the patient has taken poison with the idea of suicide, it may be necessary to hold him and give him a hypodermic of $\frac{1}{10}$ of one grain of apomorphin, which will cause vomiting and empty the stomach. To completely get rid of the poison, the stomach washing process (drinking fluid and vomiting it), should be done several times.

In case of collapse, the patient must be put to bed, stimulated with strong black coffee and strychnin, packed in warm water bottles and rolled in blankets.

In case of poisoning by morphin the patient must not be allowed to sleep. He should be kept awake by shaking, by slapping with a cold wet towel or should be kept walking until recovery takes place. Strong black coffee is of decided value and should be given freely. Morphin poisoning can be recognized by the marked contraction of the pupil of the eye when this substance is taken.

In case of poisoning by any of the gaseous chemicals, the treatment consists of getting rid of them by getting the patient

into the fresh air as rapidly as possible, and if necessary, performing artificial respiration. It may be necessary to continue artificial respiration for an hour or more in order to get rid of the poison.

Appendicitis

In the vast majority of patients suffering with appendicitis a surgical operation is necessary not only to effect a cure but in many instances to save life.

There are, however, a certain number of cases of appendicitis which will recover without operation, temporarily at least, if given proper treatment.

Appendicitis usually begins with pain in the pit of the stomach shortly followed by vomiting. As a rule the bowels have been regular or constipated—seldom is there a diarrhoea. The pulse becomes rapid—100 or more beats a minute and a fever of a 100° F., or higher is usually present or develops in a few hours. In a few hours the pain shifts from the pit of the stomach to a point to the right and a little below the navel, remaining constant there. Pressure over this point causes severe pain. A patient suffering with appendicitis usually remains quiet in bed and does not roll around as with the ordinary cramps or belly-ache, the right leg is usually drawn up.

Where appendicitis is present or suspected cathartics (medicines to move the bowels) must **not** be given. An injection of a pint of soapy water (enema) into the rectum may be given if the bowels have not moved for a day or two. While vomiting continues no food should be allowed, at most only small quantities (2 or 3 teaspoonsful of hot) water every hour may be given. Until all pain, tenderness, vomiting and fever have entirely disappeared and the pulse returned to normal (about 70 to 80 beats a minute) very little food should be allowed and this only in the form of fluids, such as thin strained soups and broths, tea and coffee and fruit juices such as grape and orange juice. Fluids are best given every 3 or 4 hours 3 to 6 ounces at a time. Milk increases constipation, forms gas in the belly and is **not** recommended.

Cold applications, cloths wrung out of cold water or an ice bag should be applied over the lower right belly. Ice bags should **never** be placed directly on the skin and their use should be **intermittent**—an hour on and an hour off. If the pain is very severe $\frac{1}{4}$ grain of Morphine sulphate may be given by mouth or hypodermic and repeated in 4 to 6 hours if necessary.

Patients suffering with appendicitis must be kept **absolutely** quiet in bed from the moment it is suspected until all pain, tenderness and fever have disappeared and have remained absent for at least 3 or 4 days.

PART V

SURGICAL FIRST AID

Wounds and Injuries

Under wounds and injuries are included not only mechanical injuries, but the effects of heat, cold, chemicals, etc. Wounds may be lacerations (torn wounds), incised wounds (cuts), punctured wounds, contused wounds (bruises), or crushing wounds.

General Care of Wounds

The most important point in the care of any wound is cleanliness. A great deal more damage may be done by infection (the formation of pus), than by the wound itself.

Open wounds should never be handled if it is possible to avoid it. It is desired to emphasize the fact that indiscriminate attempts at surgical treatment may result disastrously. Under ordinary circumstances, as on shore, it would be possible to obtain the services of a physician or surgeon within a reasonable time, but it is realized that at sea such services often cannot be obtained and for that reason directions are given for treating surgical conditions which would not be advised under any circumstances if the services of a physician would be available within any reasonable length of time. Even where a good-sized open wound exists, it is often possible to close it by strips of adhesive plaster or by simply bandaging the part in such a way as to bring the wound edges together. Where this can be done, it is preferable to stitching a wound. In the same way

in stopping bleeding it is usually possible by applying a dressing and bandaging it firmly in place to stop the hemorrhage, and it is only in rare instances that it will become necessary to pick up a vessel in artery forceps to tie it in order to control hemorrhage.

In handling any wound, it is absolutely necessary that everything which touches it be as sterile as possible and that surgical cleanliness be observed.

Surgical Cleanliness

By surgical cleanliness is meant, not ordinary mechanical cleanliness, but "germ free" cleanliness. Anything and everything coming into contact with a wound must be rendered as nearly free of germs as possible. The wound borders, the hands of the operator, the instruments and thread used in the closure of the wound, must all be prepared (sterilized) before they are used. The process of rendering everything to be used about a wound free of germs is called sterilization.

Sterilization

Sterilization can be accomplished in several ways. Heat alone, either dry or moist (steam or boiling water), will kill germs. Also certain chemicals have the power of killing them.

Sterilization and Disinfection

First aid dressings are usually sterilized in the factory by putting the dressings under 20 pounds of steam pressure for at least one-half hour and then sealing the package. If it is necessary to sterilize dressings aboard ship, it can be accomplished by putting the dressings in the galley oven until almost at the charring point or by subjecting them to a flow of live steam for at least one-half hour. Boiling will also sterilize them and may be used if no other method is available, or they may be soaked in 1:5000 bichloride of mercury solution for an hour before use. Gauze or cotton, to be used as a dressing, or

for sponging blood from a wound, should be taken from the sterile package carefully, seeing that it is not handled any more than necessary. The hands should always be sterilized before dressings are touched.

Sterilization of Instruments

The instruments, thread, etc., to be used about a wound should be boiled for ten minutes before being used. If no method of boiling is available, they should be soaked in alcohol or 5 per cent. carbolic solution for at least ten minutes before use. Do not put instruments in bichloride solution.

Disinfection of Hands and Arms

Before a wound is touched, the hands and arms of the operator should be thoroughly scrubbed with a brush in soap and warm water for a period of at least five minutes, unless there is so much bleeding as to make it imperative not to take this much time. During the scrubbing, be careful to clean the finger nails thoroughly. Following the scrubbing, the hands should be rinsed in alcohol and soaked for at least a minute in a solution of bichloride of mercury 1:2000. Following the disinfection of the hands do not touch anything which has not been sterilized.

Preparation of Wounds for Stitching

In handling clean wounds, such as cuts, where there has not been a great deal of dirt carried into the wound, the edges and even the wound itself should be painted with one-half strength tincture of iodine (tincture of iodine, one part; alcohol, one part), which will render the wound sufficiently "germ free" to be stitched without danger. If the wound is large and jagged, and has occurred over a dirty surface or if dust and dirt have been carried into it, it should first be scrubbed thoroughly with surgical soap and water, then dried and painted with half strength tincture of iodine before the stitches are put in. If the wound is on a hairy portion of the body, the borders for an inch

or more about the wound should be shaved before any stitches are inserted or a dressing is put on.

Suture Material

Catgut, silkworm gut, linen or silk are used for stitching wounds. Silkworm gut, linen and silk stitches must be removed after a certain length of time, usually about ten days. Catgut, on the other hand, is absorbed by the tissues and does not require removal and so is the stitching material used beneath the skin. The skin can be closed with any of the above materials, or if necessary, with ordinary white cotton thread which has been boiled. The stitches should be tied just tightly enough to bring the wound edges together, but not so tightly as to pinch the skin. If they are put in too tightly, they will cut through and do very little good. After the stitching of a wound is complete, the stitch line should be touched with half strength tincture of iodine. Following this, a gauze dressing should be placed on the wound. Should there be any oozing of blood, this can be stopped by a cotton and gauze dressing, put on and bandaged firmly in place.

The Hypodermic Syringe and Its Use

This instrument is used for giving certain drugs under the skin or in the muscles. The action of the drug given this way is much more rapid and certain than when given by the mouth. Both the instrument and its contents should be sterilized before use.

The best instrument is the all glass with capacity of twenty-five minims. It can be boiled in water to sterilize it if care is taken to take out plunger first, then place plunger and barrel in cold or warm water and let them come to the boiling point slowly. A piece of gauze or cotton must be placed underneath them first or they will crack in the process. After boiling for four or five minutes the plunger should be coated with a little sterile vaseline and reinserted in the barrel. The syringe can

then be kept in a clean box wrapped with a piece of sterile gauze always ready for use.

The needles have a fine bore through which a wire is usually inserted. They rust readily and become plugged. They too should be boiled and dried, the wire removed, dipped in sterile vaseline and reinserted. Then keep ready just as the syringe. Always carry one or two extra needles.

To use the hypodermic syringe a teaspoonful of water should be boiled to sterilize it. The needle may be dropped into the teaspoon and sterilized at the same time. After boiling, the

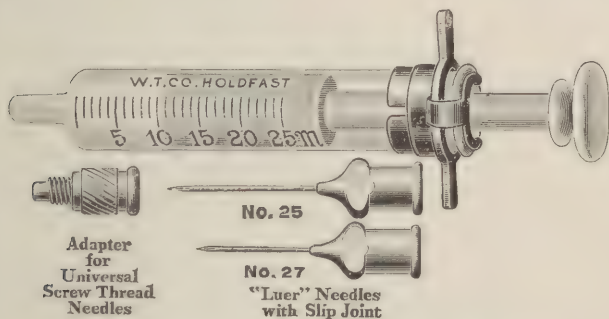


FIG. 12a.—All-glass hypodermic syringe with needles.

water is drawn up into the barrel of the syringe and the needle picked out of the spoon by its butt and fitted on the syringe. One or more hypodermic tablets, according to the dose to be given, are dropped into the spoon and the water forced out of the barrel of the syringe into the spoon causing the tablet to go into solution.

After the tablet is dissolved, the water containing the medicine is again drawn into the syringe.

Before giving a hypodermic, the skin should be sterilized with alcohol or touched with iodine. A small fold of skin is picked up between the thumb and finger of the left hand and the hypodermic needle is forced into and under the skin at an angle of about forty-five degrees. The plunger is now pushed slowly

down, forcing the medicated solution into the tissues after which the needle is removed and the point of puncture rubbed with a little alcohol.

Hemorrhage (bleeding)

Bleeding may be either from an artery, from a vein or the oozing which follows cutting very small vessels. As was pointed out in Part II, if an artery is cut, the blood comes forth in spurts and is of a bright red color. If it is from a vein, it wells forth slowly and is much darker in color than that from an artery. If no large vessels are cut, the blood oozes from a thousand tiny vessels. This last type of bleeding is easily controlled by pressure and dressings.

To Stop Arterial Bleeding

Bleeding from a small artery may stop in a short time, due to the plugging of the end of the vessel by the clot which forms. If only a small artery is cut, pressure by means of a piece of gauze directly over the wound will usually stop the bleeding, or a piece of packing (gauze) may be forced tightly in the wound. If the bleeding is from a larger vessel, it may be necessary to catch the cut end of it in a pair of artery forceps, and to tie this cut end with a catgut ligature. It should be remembered that the direction of the flow of blood in all arteries is away from the heart; consequently, when it is necessary to make pressure to stop bleeding, this pressure should be made between the wound and the heart. Sufficient pressure can be made by the fingers to stop bleeding if the pressure is applied in the right place.

If the bleeding is from the forearm, wrist or hand, pressure of the fingers on the brachial artery along the inside of the upper arm, as shown in the accompanying illustration, Figure 13, will be sufficient to stop the hemorrhage. If the bleeding is from the foot, or the leg below the knee, pressure can be made

on the femoral artery, the great artery of the leg, in the same way. Figure 14.

Use of Tourniquet.—This pressure is best made by means of a tourniquet. A tourniquet consists of either a piece of cloth, rope or piece of rubber tubing wrapped about the limb tightly enough to compress the artery. If the vessel is not too

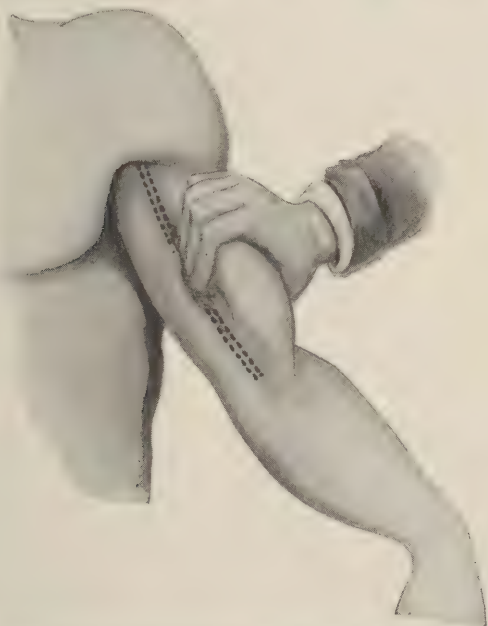


FIG. 13.—Method of stopping hemorrhage (bleeding) by making pressure with the hand on the brachial artery.

large, compression of the artery, by means of a tourniquet, will allow a clot to form in the end of the vessel, so that when the tourniquet is removed, the bleeding will have stopped. If the bleeding is from a larger vessel, after applying a tourniquet, it may be necessary to pick up the vessel with a pair of artery forceps and to tie the end of it in the manner shown in the accompanying illustration. Figure 15.

The proper method of using a tourniquet is shown here. Figure 16. A small pieces of rubber tubing makes the best tourniquet as two or three turns of it will stop bleeding without twisting it. If tubing is not obtainable or handy, a hand-



FIG. 14.—Method of stopping hemorrhage (bleeding) by making pressure with the hands on the femoral artery.

kerchief or piece of rag of any sort put about the limb, between the cut and the heart, and twisted tightly with a stick will do quite as well as any form of tourniquet. UNDER NO CIRCUMSTANCES SHOULD A TOURNIQUET BE LEFT ON FOR A GREATER PERIOD THAN ONE HOUR, unless the vessel cannot be found and tied and there is danger of

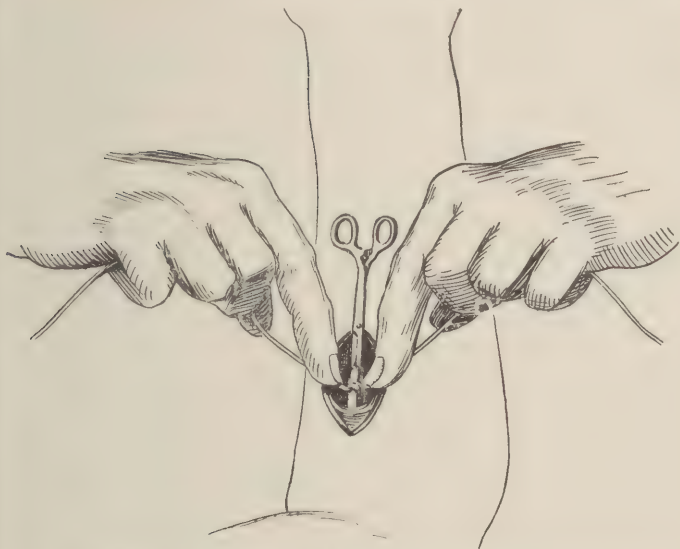


FIG. 15.—Method of using artery forceps to hold a bleeding vessel while a ligature is tied about the vessel below the point of the forceps.



FIG. 16.—(A) Method of stopping hemorrhage by using a small rubber tube for a tourniquet. (B) Showing a piece of cloth used for the same purpose, tightened by a stick passed beneath the knot.

patient bleeding to death. The tourniquet shuts off all blood to the part and if left on for any great period of time, gangrene will develop in the part below it.

To Stop Bleeding from Veins

Blood flowing from a vein is under so much less pressure than from an artery, that it can be more easily stopped by pressure alone, and if stopped by pressure for a little time, the clotting of the blood is sufficient to prevent further bleeding. If the cut vein is large in size, it may be necessary to pick it up in the artery forceps and ligate it just as in the case of an artery. Both the upper and lower ends of a cut vein should be tied. It will be remembered that the blood flow in the veins is from the extremity toward the heart, and that pressure to stop venous bleeding must be on the side of the cut away from the heart. Venous bleeding can nearly always be stopped by packing a piece of sterile gauze tightly into the wound.

Capillary Bleeding

Capillary bleeding (bleeding from tiny vessels) can practically always be stopped by a little pressure made with a piece of gauze directly over the wound, or if greater pressure is needed, a few stitches may be inserted in the skin edges and the edges brought together.

The Closure of Wounds

As stated before, wounds may be incised, lacerated, stab, contused or crushing. The clean incised wound is most readily closed and causes least trouble. After the wound edges have been shaved, where necessary, the wound itself cleaned and the bleeding stopped, it may be closed either by drawing the edges together with adhesive plaster strips extending across the wound edges, or stitches should be inserted to bring the edges together. If the wound is deep enough to have involved the muscle, the cut muscle edges should be brought together by

means of catgut stitches. After this is done, the skin is closed by means of silkworm gut or silk. Stitches should be put in about one-half inch apart and tied. Do not tie stitches too tightly or they will cut through. Tie just tightly enough to bring the edges together.

The closure of a badly lacerated wound is more difficult than of an incised wound. The chief difference, however, is that in lacerated wounds there is very often more dirt carried into the wound, and it is essential that the wound be thoroughly cleaned before being closed. Large wounds should not be closed tightly. One end should be left open and a small piece of iodoform gauze put into it to drain off blood, serum, etc., which might collect and cause trouble.

A punctured wound is usually made by a narrow sharp instrument, and unless a large vessel is cut, there is usually very little bleeding from it. If a large vessel should be cut, it may be possible to stop the bleeding by packing sterile gauze tightly into the wound. If not, it may be necessary to use a tourniquet, enlarge the wound and tie the vessel.

Dressing of Wounds

Clean wounds (those which do not contain pus) should be dressed with dry dressings only. The wound borders may be touched with a little tincture of iodine or alcohol or a small amount of alcohol may be put on the gauze which covers the wound, but unless there is actual pus present, wet dressings should not be used. On the other hand, wet dressings consisting of either bichloride solution (not stronger than 1:5000, -boric acid solution, or a solution of table salt (a heaping teaspoonful to a quart of water) are the preferable dressings for dirty wounds (those containing pus). Ointments should never be applied to a break in the skin, except in the case of ulcers such as chancre, chaneroid, or on a leg ulcer. Dressings should be changed as frequently as they become soiled or saturated with blood or pus. They should be bandaged on firmly enough to give support to the part but not so tightly as to shut off the

circulation. For the support of bruises and sprains, adhesive plaster dressings are preferred to bandages, as they remain more firmly in place and furnish better support than bandages.

Abscesses and Infection

Clean wounds usually cause very little trouble, but if pus forms, the patient may become violently ill from it, or it may burrow under the skin or muscles and spread from part to part, causing a great deal of pain together with redness, swelling and fever, or even death.

Treatment of Abscess

Wherever pus forms, it must be gotten rid of. This is usually best accomplished by making a small cut through the skin and then taking the end of a pair of artery forceps or blunt scissors, sticking them into the wound and opening them, thereby spreading the wound and allowing the pus to flow out. Figure 17. In this way, the danger of cutting large blood vessels is avoided.

Infected Blisters—Abscess of Hand

A frequent source of trouble aboard ship, especially among stokers and coal passers, is that due to the formation of blisters. These become infected and are followed by abscess formation in the palm of the hand. The hand swells enormously and if the pus is not released, the condition may lead to loss of the hand or to permanently stiff fingers. When an abscess forms in the hand, it should be opened promptly to allow the pus to escape. This is done by picking out the most swollen part and making a cut through the skin at least an inch long and then opening the cut wider with forceps. It may be necessary to make two or three incisions in different parts of the hand. After opening, the hand should be soaked for an hour in warm bichloride solution 1:5000. The bichloride solution will cause the fluids (pus, etc.) to flow out more freely. Following this, the hand

should be dressed with gauze, soaked in 1:5000 bichloride solution and the dressing kept wet. If bichloride solution is not available, boric acid solution or even a solution of table salt (a level teaspoonful to the pint), may be used with beneficial



FIG. 17.—Opening an abscess by means of a pair of blunt-pointed scissors. Note that the scissors are not used to cut but only to spread the incision after the skin has been cut through.

results. The hand should be soaked at least twice a day for an hour until the swelling subsides.

Dressing Small Wounds

No matter how small a wound is, it should be properly cleaned and dressed. If this is done, a great many abscesses and infections will be prevented. Even skinned knuckles or scratches should be touched with one-half strength tincture of iodine. If the wound is of any size, it should be covered by a dressing and bandaged. Wounds should not be sealed up with liquid court plaster or substances of that sort, unless they are very small and absolutely clean. Pus may form under such a dressing.

Burns and Scalds

The effects of moist and dry heat are nearly the same, except when carried to a point where charring results from dry heat.

Burns are classed as first, second and third degree, according to their severity. A first degree burn is slight, causing redness and pain in the skin only; a second degree burn is of greater severity, extending through the skin and causing the formation of blisters; in a third degree burn, there is an actual charring or cooking of the skin and flesh. Burns are so painful, that the patient may die from the effect of the severe pain alone.

Treatment.—On account of the pain from a severe burn covering a large area of the body, the first thing to do is give morphine. In those cases in which it is needed it should be given in half grain doses, hypodermically. The pain from a burn is due largely to the irritation of the burned area by the air, clothes, etc. The local treatment consists in protecting the burned area from the air. As a first dressing for a burn, there is nothing better than a coating of sterile vaseline. As long as the patient is kept in bed, no other treatment is necessary, no bandages or wrappings of any sort. A liberal application of vaseline is made and the patient covered by a clean sheet. If in the fly season, be sure to use a fly screen over the bed. When blisters form, they should be opened by means of a sterile knife or needle. The blistered skin should not be removed, since it gives a certain amount of protection to the injured parts beneath. When pus forms under these blisters, they should be cut away, as the patient will become very ill if he absorbs the pus confined in the blisters. Where pus forms, wet dressings of boric acid solution (a tablespoonful of boric acid to the pint of water), should be used. These dressings, if kept well saturated, and changed once or twice a day, will tend to drain away the pus and prevent it getting into the system. For small burns, a sterile vaseline dressing covered by clean gauze is as good a treatment as any that can be adopted. In case of a severe burn, the diet should be very light or fluid. The bowels should be cleaned out thoroughly once a day by injection, if necessary.

Cold

The effects of cold most commonly seen are frost bite of the fingers, toes, ears and nose. Usually, the first symptom noted will be a whitening of the part, with loss of feeling. If the cold continues, the circulation through the part stops. Gangrene may develop. Even with slight frost bites, blisters and sloughing may occur.

Treatment.—In thawing out a frost bitten part, do not use warm water nor bring the part near the fire, as the abrupt change from extreme cold to heat will almost always cause a reaction which may result in gangrene. The best method is to rub the part with snow or ice water, continuing this treatment until the circulation returns, together with feeling and color. After the circulation is restored, apply sterile vaseline dressings or simply smear the parts with sterile vaseline and protect them from further cold. If gangrene has set in and the parts have turned black, it may be necessary to trim off this dark gangrene portion. This can be done without pain as feeling is lost in gangrene.

Bruises

Bruises are due to injury of the tissues by blunt instruments, causing a break in some of the smaller vessels of a part, with a leaking of blood into the tissues and the consequent formation of a black and blue spot.

Treatment.—Minor bruises require no treatment. If of a greater extent, they may require rest in bed. Hot water bags placed on the bruised area, hot flannels and gentle rubbing may hasten recovery. Occasionally, as a result of a severe bruise, a large blood vessel may be ruptured. In this case, it is sometimes necessary to open the bruised area with a knife and forceps, to get rid of the blood clot which lies underneath.

FRACTURES

Fractures are classified as simple, those in which the bone is broken, without pushing through the skin; compound, in

which the ends of the bone fragments pierce the flesh and skin; comminuted, in which there are numerous fragments (crushing and splintering of the bone). There may be any combination of these conditions and, in addition, there may be considerable angular deformity or there may be over-riding of the fragments, causing considerable shortening of the part.

Fractures usually follow more or less severe injuries, except in old persons with brittle bones which break very easily. The head of the thigh bone (femur) may be broken by a false step.

Signs of Fracture.—The signs of fracture are pain, deformity, unnatural movement in the part, crepitus, which is the noise made by the ends of the broken bones moving over one another, extreme pain on pressure over the break, marked swelling of the tissues which become black and blue within a very short time. This is usually accompanied by the formation of blisters on the skin.

Examination for fracture should be made as soon as possible after the accident, as it is more difficult to make out a fracture after the swelling occurs. There may be considerable shortening of the part, especially where there is only a single bone, as in the thigh or the upper arm. There may be no shortening at all, in a fracture of the bones of the lower leg or of the forearm, due to the fact that there are two bones, one of which act as a splint for the other. Shortening in case of fracture of the thigh bone may be as great as three or four inches. Crepitus is a valuable sign of fracture, but cannot always be detected. When other marked signs are present, it should not be looked for, as the soft tissues may be damaged by endeavoring to elicit it and the bone ends may be forced further out of position.

Treatment of Fracture.—When a fracture occurs, before moving the patient some sort of temporary splint must be applied to prevent pain and further injury by the movement of the broken bones, especially if the fracture involve a movable part like an arm or leg.

Any rigid thing will do for a temporary splint, an umbrella, mop or broom handle or any piece of board. Let the splint

reach across the joints above and below the fracture, and tie in place with a piece of rope or bandage.

One of the best splints to use in moving a patient is a pillow especially where an arm or leg are involved. Use a pillow that is not too soft. Lift the broken part carefully on the pillow and fold the ends of the pillow snugly over, tying in place with pieces of bandage or rope. Such a splint can often be made use of for quite a while in treating some fractures. (See Fig. 27.)

Fractures are attended often with a good deal of pain, and the muscles assume a state of spasm. To meet these conditions morphine is often necessary. It relieves the pain and relaxes the spasm, permitting more satisfactory setting of the fracture. If it were not for the danger, chloroform could be used. Except in the hands of a doctor, however, this is to be avoided.

Splints

Splints serve various purposes. If properly applied, they hold the broken ends of the bones in correct position to one another so that they may heal. If there is any movement between the fragments, healing does not take place. Splints also serve to reduce the pain from fracture, by preventing movement. They may be made of any substance which is stiff enough to furnish the necessary support to a broken bone, and are made in many shapes, these shapes conforming to the shape of the part on which they are to be used. The most commonly used splints are straight thin pieces of yucca or basswood about four inches wide and of varying lengths.

Long, straight splints of heavier material are used for fracture of the femur. There are also especially made splints of different shapes to fit the leg and foot or the bend of the elbow. The chief requirement of a splint is that it conform as nearly as possible to the normal shape of the part on which it is to be used, in order that it will hold that part in the correct position. *Great care must be taken to see that splints are carefully padded before use.* This is best done by covering the splint with a heavy layer of cotton or other soft substance and then wrapping a bandage over this to hold it in place.

In applying a splint to a fracture, great care should be exercised to see that it is not bandaged so tightly as to stop the circulation or to cause a pressure sore. Frequently, splints are bandaged so tightly that they do more harm than good, through the damage they do to the soft tissues. If a splint feels uncomfortable, and is causing pressure, it should be removed, repadded and again adjusted to the part. It is a good idea, especially if there is much pain or temperature following splinting, to carefully remove the splints and see that they are not causing pressure sores. In fracture of the thigh or leg, the pressure of the splint sometimes causes a sloughing of the soft tissues over the heel, leaving an ulcer which may last for weeks or months. Where it is necessary to use a splint on the foot and leg, the heel should be protected by a ring of cotton placed under it or the foot should be raised to take the pressure off the heel.

Except in case of compound fracture, where it is necessary to sterilize the wound edges, the skin should never be painted with iodine before a splint is applied, as the iodine sometimes causes a sloughing of the skin and the flesh under the splint. If it is desired to clean the skin before putting on a splint, it should be washed with a piece of gauze wet with alcohol. According to the site of the fracture, splints must be left on for from three to six weeks. In the case of a heavy weight-bearing bone, such as the thigh bone, a splint should be used for four to six weeks, and no weight should be placed on the limb for two or three weeks after it is removed.

Difference in Treatment of Simple and Compound Fractures

Simple fractures are the easiest to treat. There is usually a single break, and the fragments can be readily put into the correct position and held there by means of splints. In treating compound fractures, however, where the broken bone ends project through the skin, the wound must be sterilized as thoroughly as possible to prevent infection of the bone. Fragments of clothing, splinters and gross dirt must be removed, if necessary, by picking them out or by scrubbing with surgical

soap and sterile (boiled) water. Before this is done, from a quarter to a half a grain of morphine should be given by hypodermic to control the pain. After the worst of the dirt is removed, the broken bone ends and the skin around it should be painted with one-half strength tincture of iodine, which should be washed off afterward by a little pure alcohol. The wound should next be covered by sterile gauze firmly bandaged in place. After this is done, the bone ends should be manipulated into position and splints applied as in simple fracture.

Almost any bone in the body may be broken by an accident, and the treatment, as outlined above, is applicable to any fracture. Certain fractures are more common and will be taken up in greater detail below.

Fracture of the Bones of the Forearm

Either the radius, the bone of the thumb side of the forearm, or the ulna, the bone of the little finger side of the forearm, may be broken. Fracture of the radius is more common, so that the treatment of this condition will be described. Practically the same treatment is applicable for fracture of the ulna.

Fracture of the Radius

In fracture of the lower end of the radius, in addition to all the other signs of fracture, there will be a deformity such as that shown in the accompanying illustration, Figure 18. This deformity causes the lower part of the arm to resemble in shape a table fork and is known as a "silver fork deformity."

Treatment.—Prepare two splints of thin board. The one for the palm side of the forearm should be long enough to extend from the elbow to the middle of the palm of the hand. The other for the back of the forearm should be a little shorter, but should extend from the elbow to the lower part of the wrist on the back of the hand. These splints should be just a little wider than the arm. They should be carefully padded with

cotton or soft cloth. If a deformity exists it should be reduced by making traction (a pull) on the hand while an assistant holds the elbow. During this pull, the projecting fragments of bone should be pressed back into their normal position with the fingers of the other hand. The arm should be placed between the splints, in such a way that the thumb will point directly upward and that the palm of the hand will lie against the chest wall. The splints should be fastened, firmly but not so tightly as to shut off the circulation, by means of strips of adhesive plaster. Next, a roller bandage is put on, beginning at the

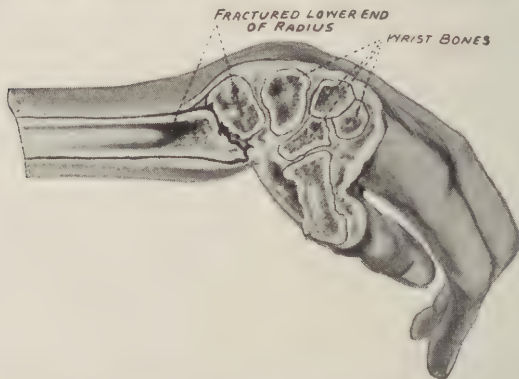


FIG. 18.—Deformity in fracture of the lower end of the radius.

hand and extending to the elbow. The arm should be carried in a sling. These splints should be worn for at least four weeks, though it is advisable at the end of a week to gently remove them in order to rub the skin with alcohol. Should much swelling occur, it may be necessary to loosen the bandages. Figure 19.

Fracture of the Arm (between the Elbow and Shoulder)

The treatment of fracture of the humerus (the single bone of the upper arm), is much more difficult than treatment of

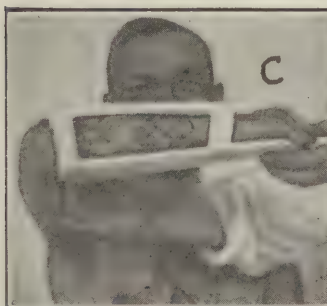
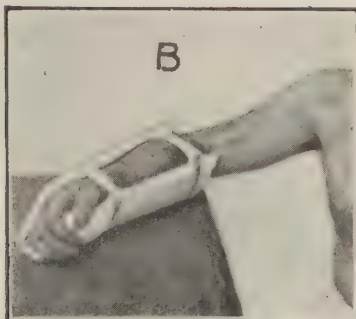
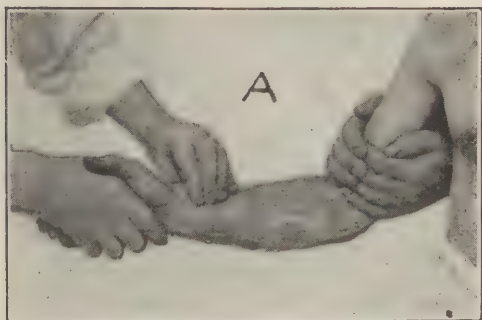


FIG. 19.—(A) Reduction of a fractured bone of the forearm. (B and C) Proper length splints held in place by adhesive strips. (D) Dressing completed.

fracture in the lower arm. To get the best results in this fracture, it may be necessary to keep the patient in bed. Fragments of a fractured humerus may be held in place by making a straight splint long enough to extend from the arm pit to the tips of the fingers. This should be padded well, one end more heavily than the other. The heavy padded end of the splint should be placed in the arm pit and the arm bandaged firmly to it, after which the arm and splint may be strapped to the side of the body. If the fracture is in the middle of the shaft of the bone, short splints, extending from the shoulder to the elbow, may be used. These should be four in number and should be placed on the front, back, inside and outside of the arm and firmly bandaged in place. The lower arm should be carried in a sling.

If the fracture is in the upper end of the bone near the shoulder, it can best be held in place by making a shoulder cap of pasteboard or substance of this sort. This should extend over the shoulder and down to the elbow. The arm should then be bound firmly to the side of the chest.

By using a small, well padded triangle, eight inches each way, in the arm pit and then binding the arm firmly to it and the chest wall, by adhesive plaster, and supporting the forearm in a sling, quite satisfactory results can be obtained. Figure 20.

Fracture of the Femur (Thigh Bone)

Fracture of the femur, or thigh bone, usually follows a more or less severe injury. Occasionally, as stated above, in the case of old people it may occur from a very slight injury. In fracture of this bone, the patient will be unable to step on the affected leg. When lying at full length, the toes and foot of the affected leg turn out, as shown in the accompanying illustration, Figure 21. If a measurement is taken of the two legs, measuring from the top of the hip bone to the lower end of the inside of the ankle bone, the broken leg will be found to be from one to four inches shorter than the good leg.

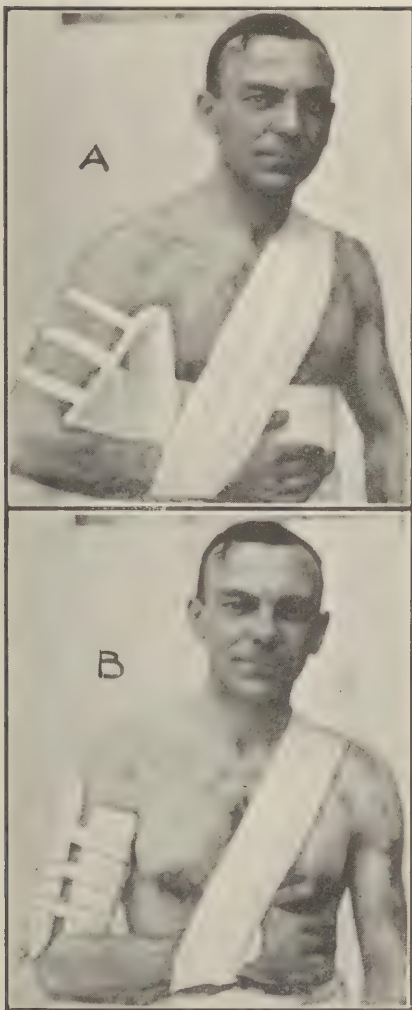


FIG. 20.—(A) Method of use of triangular splint for fracture of the bone of the upper arm. (B) Method of use of 4 small padded splints (tree box) for the same purpose.

Treatment.—The treatment in these cases is to get the patient into a firm bed, and to make a continuous pull on the leg, if there is any shortening. A traction arrangement can be fixed up in the following manner: See illustration, Figure 22. Several adhesive plaster strips are fastened to the skin of the thigh beginning two-thirds the way to the hip and extending



FIG. 21.—Turning out (eversion) of the foot in fracture of the upper end of the left femur.

half-way down the lower leg. Shave the skin before applying plaster. At least four of these strips will be necessary. These are bandaged to the leg and brought down and fastened to a small block. A rope is fastened to this block and this is carried through a single pulley. A weight of from ten to twenty pounds is attached to the end of the rope. It will be necessary to elevate the foot of the bed or to fasten the patient, in some way, to

prevent his sliding against the foot of the bed. The idea of this arrangement is to cause a continuous pull, day and night, on the leg to prevent shortening and if the patient slides against the foot of the bed this pull is lost. An apparatus of this sort must be kept on for from four to six weeks. The patient should be kept in bed for a considerably longer period. No movement should be permitted that can possibly be avoided. It will be necessary during this time that he use a bed pan.



FIG. 22.—Buck's extension with weights and pulley for fracture of the femur.

Another method of treatment of fracture of the femur, especially where it is necessary to move the patient, is to use a long, single splint extending from the arm pit to the foot. This is strapped and bandaged to the leg and body, in the manner shown in Figure 23.

Still another method of treatment is to use sand bags (each about four to four and one-half inches in diameter and about two feet long), to hold the injured leg in the proper position. This form of treatment will hold the bone sufficiently quiet to allow healing, but usually results in some shortening of the leg.

Elderly people should be propped up in bed, to prevent the development of pneumonia which may occur if they are kept flat on their back for any length of time. In any method of treatment of fracture of the femur, keep the leg straight and the toes straight upward.



FIG. 23.—Long single splint extending from arm pit to below the foot for fracture of the femur.

Fracture of the Bones of the Lower Leg

Fracture of the bones of the lower leg is a very common injury and is usually due to direct violence. The most common form of fracture is that shown in the accompanying illustration, Figure 24, which is known as Pott's fracture. The treatment, as in the case of fracture of the bones of the forearm, consists in lining the bones up, comparing them with the opposite leg and then putting the leg and foot into a well padded splint. A splint such as shown here is convenient for this type of fracture. Figure 25. Pott's fracture, in which there is some outward displacement, can be treated by using a straight board splint long enough to extend from the knee to about four inches below the sole of the foot. This should be well padded, having



FIG. 24.—A common type of fracture (Pott's) about the ankle joint.

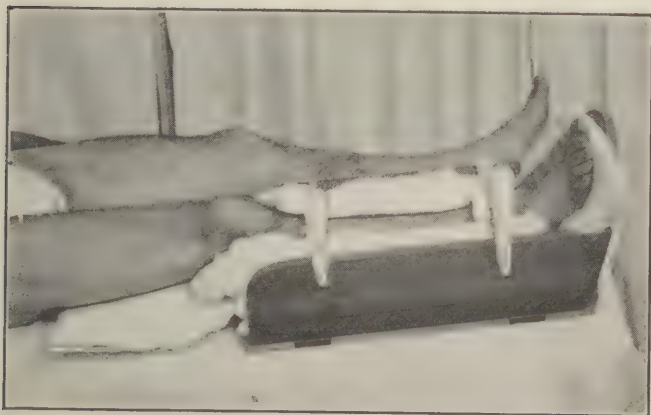


FIG. 25.—Use of wooden fracture box for fracture about the ankle.

the padding exceptionally heavy just above the ankle and not extending quite to the lower end of the splint. The splint should be applied to the inside of the leg so that the foot and ankle will extend below the padding. In bandaging the foot and leg to the splint, the outward displacement will be corrected. Figure 26.

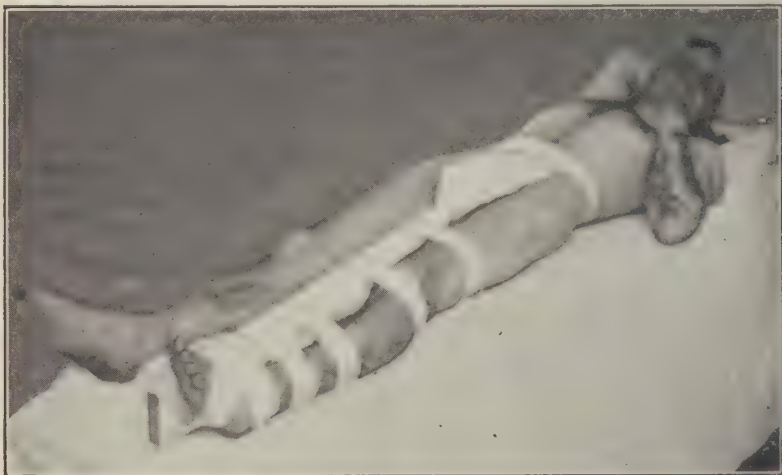


FIG. 26.—A single well padded internal splint for fracture about the ankle.

A feather pillow wrapped around the leg and foot and bandaged in place, makes a good emergency splint for fracture about the ankle. Figure 27.

Fracture of the Ribs

The symptoms are, severe pain on taking a long breath; pain when pressure is made over the front and back of the chest at the same time, and in severe cases, spitting of blood from injury to the lung.

Treatment.—The treatment of fractured ribs consists in keeping the chest wall as quiet as possible, by strapping with

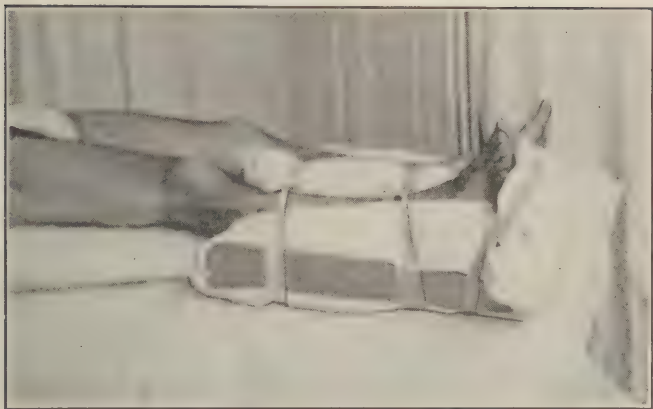


FIG. 27.—Use of a pillow as a splint for fracture about the ankle.



FIG. 28.—(A) Method of applying adhesive strips for fractured ribs.
(B) Adhesive dressing for fractured ribs completed.

adhesive plaster. This is done in the following manner. Figure 28. The straps must be overlapped and must extend from the middle of the chest in front, to the backbone behind. Each one should be put on after the patient has blown out all the air from his lungs. In this way, the straps can be made tight enough to keep the chest from expanding.

Fracture of the Jaw

Fracture of the jaw often occurs from a blow on the chin. Following this injury, the teeth will not meet properly (are out



FIG. 29.—Method of using a two tailed bandage for fracture of the jaw.

of line). If the two sides of the jaw are grasped in the fingers, grating of the fragments may be felt. The treatment consists in bringing the teeth into as good a position as possible and then bandaging the jaws tightly by means of a bandage which goes over the point of the chin, and is fastened on top of the head and at the back of the neck. Figure 29.

If small silver or copper wire is available, the fragments of the patient's jaw may be kept in place by passing wires between the teeth on each side of the break and twisting them together.

The mouth should be washed out very carefully several times a day with alkaline antiseptic solution. The food should be very soft or fluid.

Fracture of the Skull

Severe fracture of the skull is usually accompanied by bleeding from the ears, mouth and nose or by hemorrhage into the space behind the eye ball. The fracture may be merely a depression of the vault of the skull. The injured person may or may not become unconscious at once. He may lose consciousness two or three hours after the injury and may never recover. Very little can be done for these patients at sea except to put them to bed, keep them as quiet as possible with an ice cap to the head. Recovery is usually very slow and may leave some mental defect.

Fracture of the Spine

Fracture of the spine occurs occasionally, especially in falls from aloft. If severe, it may result in paralysis of all parts below the fracture, with loss of control of the bowels and bladder. The only treatment that can be instituted in these cases is to keep the individual as quiet as possible and to place sand bags about him to prevent movement. Keep the patient clean and dry. Make pads of cotton or waste and gauze to use as diapers.

Fracture of the Pelvis

The bones of the lower part of the trunk form the pelvis. They are sometimes broken by severe crushing injuries or falls. The treatment consists in keeping the patient in a hard bed and as quiet as possible. Sand bags should be placed on each side of him and held in place by a broad muslin bandage passing around both the hips and the sand bags.

DISLOCATIONS

Dislocation is a condition in which the normal relation of two or more bones of a joint is changed; in other words, one or more of the bones is "out of place." Dislocation of a part is usually accompanied by severe stretching or tearing of the straps (ligaments) which hold the bones together. Each joint in the body is surrounded by a heavy, tough membrane. This membrane surrounding the joint is called the capsule. When this capsule is torn and the end of the bone projects through it, it may be very difficult to put the end of bone back into place.

Almost any joint in the body may be dislocated. The most common dislocations, however, are of the fingers, shoulder and hip. The condition nearly always follows an injury, quite frequently, a fall. Deformity is always present in a dislocation and the head of the bone can usually be felt outside the socket. There will be no crepitus as in the case of fracture. The part cannot be moved, due to the fact that the muscles lock the joint in one position to protect it. Reduction of a dislocation consists of putting the head of the bone back into its proper place.

In case of dislocation of the finger, grasp it firmly, make a straight pull and with the fingers of the opposite hand, force the bone end back into place. When a dislocation is put back in place, a snap or crack will usually be heard as the bone falls back into its socket.

Dislocation of Shoulder

In dislocation of the shoulder, the head of the humerus (upper arm bone) usually drops downward into the arm pit, though it may go forward or backward. In any case, the head of the bone can be felt outside the socket. This causes a flattening of the point of the shoulder and gives an appearance such as is shown in the accompanying illustration. Figure 30. In dislocation of the shoulder, when the elbow of the affected arm is placed against the chest wall, the hand on the affected side can-

not be placed on the opposite shoulder, or with the hand on the shoulder, the elbow cannot be brought to the chest wall.

Treatment.—The simplest treatment is to lay the patient flat on his back on a table or on the deck; the operator removes a shoe, places his unshod foot in the arm pit against the head of the bone, and makes firm traction (pull) on the arm. This traction should be at an angle of about 45 degrees from the body. This method is especially applicable to dislocation where

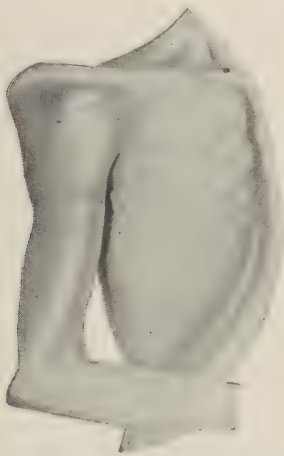


FIG. 30.—Dislocation of the shoulder joint.

the head of the bone is in the arm pit. In most cases, this procedure will bring about an immediate reduction of the dislocation. When the dislocation is reduced, the arm at the shoulder becomes freely movable. Following reduction, the arm should be put in a sling and kept quiet for at least a week, preferably two weeks, since if there is a tear in the capsule of the joint, the bone may easily slip out again unless sufficient time is given for healing of the stretched and torn tissues.

Dislocation of the Hip

Dislocation of the hip usually follows a more serious injury than that leading to dislocation of the shoulder joint. In dislocation of the hip, the toes of the affected side turn inward and, on account of the shortening, rest against the upper part of the instep of the opposite foot. The thigh and leg are rotated



FIG. 31.—Partial flexion and internal rotation in dislocation of the hip.

inward with the thigh partly flexed on the body. The leg can not readily be straightened. If measurement of the affected leg is made, usually about two inches of shortening will be found. Do not confuse dislocation of the hip and fracture. In fracture, the leg and toes usually turn out; in dislocation, they turn in. In addition, in fracture, there is too free motion of the parts, while in dislocation, motion is nearly abolished. The appearance of hip joint dislocation is shown in the accompanying illustration. Figure 31.

Treatment.—The reduction of dislocation of the hip joint can usually be accomplished by gentle manipulation; the idea being to carry the head of the hip bone back through the same course through which it came in the process of dislocation. Lay the patient on his back on the deck. Bend the leg on the thigh and the thigh on the body. Grasp the foot and ankle in one hand placing the other hand under the knee to guide it. With the leg and thigh flexed, carry the knee of the affected leg well over the midline toward the good leg. Next, throw the knee of the affected side outward, at the same time rotating the thigh outward by carrying the foot of the affected side toward the good side and at the same time forcing the knee of the affected side outward. Next, straighten the thigh and leg on the body. No great force is necessary in reducing dislocation of the hip and treatment of this sort will usually bring about a reduction. Too much force may lead to fracture of the bone.

Treatment of Dislocations in General

The treatment of other dislocations is very much the same as above; namely, manipulate and make extension until the bones are brought back into their proper position, after which the part is kept quiet for some time to allow healing of the stretched and torn tissues surrounding the joint. Dislocations are often associated with much pain and the muscles may show the same sort of spasm as occurs in fractures. Morphine may often be given with advantage just as in the treatment of fractures (page 65, section 5).

Dislocation of Jaw

The lower jaw is occasionally dislocated by yawning widely, or by a blow on the point of the jaw when the mouth is open. If the jaw is dislocated, the patient will be unable to close his mouth, the jaw standing half open. The condition is very painful.

Treatment.—The treatment consists in wrapping the thumbs thoroughly in cloth, cotton or bandages, placing the two thumbs on the back teeth of the lower jaw, forcing down with the thumbs and at the same time using the fingers to pull up on

the point of the jaw. This will snap the jaw back into place. Be careful that the thumbs are not badly bitten when the jaw snaps back into place, as the mouth will immediately close tightly when the dislocation is reduced.

Sprains

A sprain, or a strain, of a joint is a condition due to overstretching or tearing of the ligaments or straps holding the bones of a joint together. A sprain is not followed by deformity other than swelling, though the tissues around the joint become black and blue.



FIG. 32.—Method of applying adhesive strips for sprain of the ankle.

Treatment.—The treatment for this condition is rest, soaking in extremely hot water and the application afterward of adhesive strips to hold the part from moving. The method of using adhesive strips for a sprained ankle is shown in the

accompanying illustration. Figure 32. If the sprain is not severe, soaking in hot water followed by a thorough rubbing with liniment will be sufficient, through the soreness from a sprain remains for several days, or possibly weeks. If severe enough to require rest in bed, an ice bag over the part will prevent swelling.

Effects of Electricity

Electricity has both a general and a local action. The general action consists of a shock accompanying the passage of a strong electric current through the body. This may lead to momentary unconsciousness, to prolonged unconsciousness or perhaps to death. Should some member of the crew come into contact with a strongly charged electric wire, he will be unable to let go of this wire or to get away from the electrical contact because of the spasm of the muscles. The current should either be immediately shut off, if this is possible, or if not, the victim should be pulled away from the electric wire. In doing this, use rubber gloves, a piece of rubber packing or other non-conducting material to grasp the body. If nothing of this sort can be found, a strip of dry cloth or a dry board may be used to break the contact. Whatever is used must be non-conducting material or the rescuer will find himself in the same condition as the original victim. The local effects of electricity consist of burns very similar to those caused by fire or chemicals except that they heal more slowly.

Treatment.—The treatment of electric burns is the same as the treatment of ordinary burns.

Drowning

In an individual apparently drowned, the face should be exposed, the mouth and nostrils cleansed of water or mud, and the clothing should be opened to give free access to the chest. Next, turn the patient on his face and place under the upper part of his abdomen a roll of clothing, a blanket, or anything which will cause the head to hang down and will allow the water to drain from the lungs. Drainage may be aided by making

pressure over the lower part of the back. This may also be done by standing over the patient, lifting him by the middle of his body and holding him for a moment or two in this position. During this time, the mouth should be held open and if possible the tongue should be pulled forward.

Artificial Respiration

Keep the mouth open and pull the tongue forward by grasping it with a handkerchief or bit of cloth. While standing or kneeling astride the patient, facing his head, the palms of the hands are placed over the lower part of the patient's chest and by throwing the weight forward, pressure is made against the lower part of the chest, decreasing the capacity of the chest and forcing out the air which may be contained in the lungs. When the pressure is removed, air will be sucked into the lungs by the springing out of the chest wall. This motion is continued slowly about twelve or fourteen times to the minute, no faster. If an assistant is at hand, continuous rubbing of the limbs of the patient toward the body may aid in restoration. Do not stop artificial respiration under two hours, as there is still a chance to restore life, even after this period of time. As soon as breathing is established, remove any wet clothing, wrap in warm blankets, place in bed and allow rest for at least forty-eight hours. Figure 33.

Childbirth

Occasionally, childbirth occurs at sea and it becomes necessary for an officer or member of the crew to attend the birth. With the exception of the final care of the infant, no medical attention is required for normal childbirth.

At the conclusion of "term" (about 280 days), the woman begins to have cramps in the back and lower part of the abdomen. These cramps are called labor pains. They begin very gently and increase gradually in strength and frequency until the birth of the child. The "bag of waters" bursts during

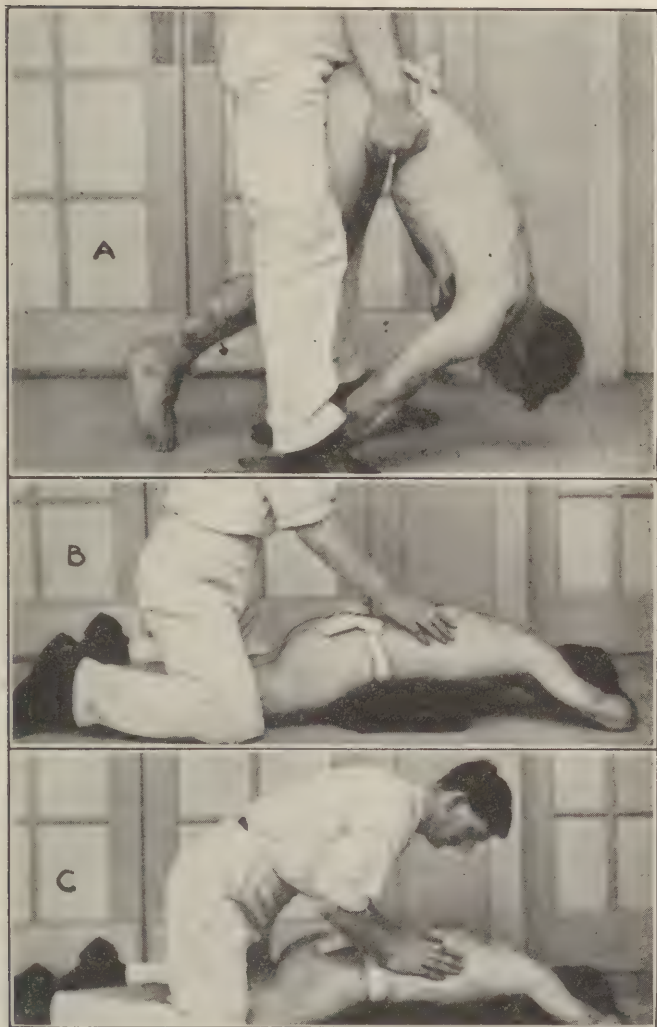


FIG. 33.—Resuscitation of the drowned. (A) Draining water from the lungs. (B) Position for artificial respiration. (C) Compressing the lower part of the chest to expel air from the lungs; this is followed by position shown in B, which allows the chest to expand and draw air into the lungs.

labor; usually, near the conclusion of the labor, shortly before the child is born. Under normal conditions, the child is expelled head first and face down, when the woman is lying on her back. As soon as the head is born, the body and limbs follow very quickly. At times, if the pains are weak, it may be necessary to aid the birth of the child, by hooking a finger into the arm pit and making traction.

Care of the Child

Immediately after the child is expelled, its mouth and nose should be wiped free of blood and mucus, and, if it does not cry or show immediate signs of breathing, it should be slapped gently on the buttocks, or a few drops of cold water sprinkled over it. Usually, this will cause it to cry vigorously. Do not hurry or get excited at this stage, as the child can be allowed to lie beside the mother or between her legs while arrangements are made for its care.

The cord, extending from the mother to the child, must next be cut. It is first tied by a bit of twine or cord, which has been boiled, about one inch from the child's belly. It is tied in a second place about one-half inch beyond this, and the cord is cut between these two ligatures.

At the time of birth, the child will usually be found covered by a thin coating of a whitish waxy substance. This is best removed by thoroughly oiling the skin with sweet oil or olive oil, after which the child should be carefully bathed in warm water and white soap. After the bath, the stump of the cord is dressed. Dressing the stump of the cord consists of powdering it with boric acid powder and placing on the stump a small pad of sterile gauze which should be held in place by means of a belly-band about four inches in width which goes around the child and is pinned in the back. The cord stump should be dressed each day. After about a week or ten days, the stump of cord falls off, leaving a small raw area which should be dressed as indicated above until completely healed.

After Care of the Mother

Immediately after the child is born, the labor pains usually cease for a time, and begin again in from ten minutes to a half hour, and continue until the "after-birth" is expelled. The expulsion of the "after-birth" is usually followed by a single gush of blood. This stops almost immediately, especially if the lower part of the woman's abdomen is gently kneaded. If bleeding continues, it may be necessary to give a teaspoonful of fluid extract of ergot, if available, and continue the massage of the abdomen. Next, a clean, sterile pad should be placed over the woman's genitals and fastened by means of a "T binder, the large end of which goes between her legs and is attached to a belt around her waist. The mother should remain in bed for at least a week, preferably longer, after the birth of the child. The baby may be put to the breast, for nursing, immediately after birth, although little nourishment will be secured for a couple of days as the milk does not "come in" for about two days after the child is born. In the meantime, it should be given a little slightly warmed water to drink every two or three hours.

Stricture of the Urethra

(Water Passage)

Stricture is a narrowing of the urinary tube. It is usually a result of long continued gonorrhea, although it may be caused by other forms of injury. Stricture usually develops very slowly and it may be several months or years after an attack of gonorrhea before it develops or before it becomes difficult to pass water. In severe cases, the stream gradually becomes smaller and smaller, until finally the urine can only be forced out drop by drop.

Treatment.—The treatment of stricture must be carried out by a physician. It occasionally happens that there is acute retention of urine in the bladder associated with stricture or

from some other cause. When retention occurs, the bladder may become greatly distended so that it forms a tumor-like mass in the lower part of the abdomen. When this occurs, it may be necessary to draw the urine. Sometimes retention of urine is the result of spasm of the muscle, in which case it may be possible to relieve the condition by placing the patient in a hot bath and having him attempt to urinate while in the bath, or hot compresses (cloths rung out of hot water) may be placed between his legs, around the scrotum and penis, in an attempt to relieve the spasm. Occasionally a hot mustard foot bath will bring about the desired result. These methods should be tried before an attempt is made to pass a catheter.

Catheterization

An attempt should always be made to pass a rubber catheter before resorting to the metal one. The catheter should be sterilized by boiling before use. It should then be oiled with sterile vaseline and after cleaning the mouth of the urethra (water passage) with a piece of cotton wet in bichloride solution, the catheter should be gently passed into the water passage and an effort made to force it back into the bladder. The catheter usually goes in about eight to ten inches before it enters the bladder. It is best to try to pass about a number nine soft rubber catheter at first. If this cannot be used, a smaller one may be tried.

If the passage of the rubber catheter cannot be accomplished, the metal one should be boiled, the end dipped in sterile vaseline and an attempt made to pass this. Figure 34 shows the course through which the catheter must pass to enter the bladder. Do not use any force in passing a catheter.

Occasionally, the catheter cannot be passed into the bladder and it becomes necessary to make a small incision through the skin just above the pubes, the bone in the front of the lower part of the belly, and puncture the bladder through this opening. If it is possible to obtain the services of a physician in any reasonable time, this operation should never be attempted.

Piles

Piles are dilated veins of the rectum. When inflamed, they are very painful, causing a constant burning sensation about the anus which is greatly increased during and after bowel movements. When the veins rupture, the condition is known as "bleeding piles." Piles are often due to long continued constipation, and when the constipation is relieved they disappear.

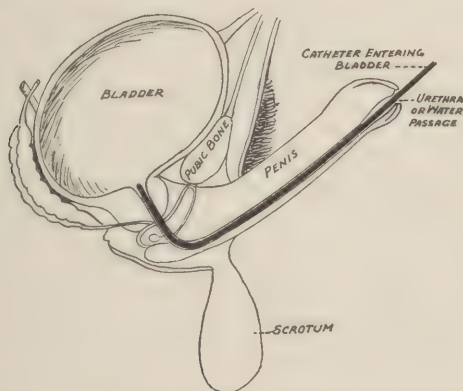


FIG. 34.—The course through which a catheter must pass to enter the bladder.

Treatment.—If the piles protrude or if they become strangulated, they should be pushed back with the finger or with a cloth thoroughly coated with oil or vaseline. See that the bowels move regularly, at least once a day. Use a low injection if necessary. If the piles become strangulated and cannot be pushed back, use hot applications. Long continued piles require an operation for their cure.

Hernia (Rupture)

A rupture is a condition in which the contents of the belly cavity are forced out through a defect or split in the muscles.

A rupture usually shows as a lump formation in the groin or just below the groin in the thigh or in the scrotum. A rupture is not dangerous as long as the muscles do not draw together and pinch the contents of the sac. When the muscles draw together and pinch the contents of the hernial sac, the hernia is "strangulated."

Should strangulation occur, an immediate attempt should be made to reduce (force the contents of the hernial sac back into the belly) the hernia, by making gentle pressure over the outside of the sac, at the same time kneading and manipulating the mass in an endeavor to pass the contents back into the belly. Very little force should be used, as it is possible to rupture the gut in attempting to reduce a strangulation.

If the hernia remains strangulated, and medical help is not available within twenty-four hours, the outlook for the patient is extremely serious as continued strangulation usually results in death. Therefore, it is highly necessary that the hernia be reduced. An attempt should be made to relax the muscles sufficiently by flexing the thigh on the body and then attempting to return the hernial contents back into the belly. If this cannot be accomplished it may be necessary and advisable to give chloroform to thoroughly relax the muscles in a further attempt to reduce strangulation.

When a hernia becomes strangulated, this strangulation is accompanied by a great deal of pain and within a comparatively short time is followed by continuous vomiting. Occasionally, there will be a marked looseness of the bowels (diarrhea), for a short time, followed by an inability to make the bowel move at all. This is due to the fact that a loop of the gut is caught in the hernial sac and nothing can pass through it. In case of a severe strangulation of a hernia which cannot be reduced, the patient should be taken immediately to the nearest doctor for operation. If the strangulation continues, it nearly always means the death of the patient.

Foreign Bodies in the Eye

The removal of a small foreign body from the eye is usually very simple but occasionally where the foreign body becomes imbedded in the eye ball, it is considerably more difficult. If it is not imbedded, a bit of cotton wrapped around the end of a tooth pick or match stick can be used to brush the foreign material off the eye ball. If it is imbedded, it will be necessary to cocainize the eye by dropping into it one drop of 1 per cent. cocain solution every three minutes until three or four drops have been put in the eye. After this is done, it will be found that the eye ball has lost its sensitiveness, so that the foreign body may be removed without pain to the patient, by using the flattened end of a clean tooth pick. Great care should be taken that the eye ball is not scratched more than necessary. Following the removal of the foreign body, the eye should be washed with boric acid solution two or three times a day and if very painful should be bandaged for a day or two.

APPENDIX

EXCERPTS FROM REGULATIONS, UNITED STATES PUBLIC HEALTH SERVICE

Hospital Service for Sick and Disabled Seamen

" 360. The following persons are entitled to the benefits and facilities of the hospitals and relief stations of the service under special rules hereinafter prescribed:

- (1) Those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessels of the United States, or in the service on board of those engaged in such care, preservation, or navigation.
- (2) Seamen employed on yachts, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.
- (3) Seamen employed on United States Army transports or other vessels belonging to the United States Army, when not enlisted men of the Army.
- (4) Officers and enlisted men of the United States Coast Guard.
- (5) Officers and employees of the Public Health Service.
- (6) Seamen employed on the vessels of the Mississippi River Commission.
- (7) Seamen employed on the vessels of the Engineer Corps of the Army.
- (8) Officers, crews of vessels, keepers, and assistant keepers of the Lighthouse Service.

- (9) Officers and seamen on vessels of the Coast and Geodetic Survey.
- (10) Civil employees of the United States who are injured while in the performance of their duties.
- (11) Officers and crews of vessels of the Bureau of Fisheries.
- (12) Patients of the Bureau of War Risk Insurance.
- (13) Patients for special study and investigation.

“ 361. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the service.

“ 363. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

“ 364. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the service without reference to length of service.

“ 365. A sick or disabled seaman, in order to obtain the benefits of the service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Public Health Service, to an officer of that service, or to the proper customs officer acting as the agent of the said service at stations where no medical officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

“ 366. Masters' certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for 60 days of continuous service 'in a registered, enrolled, or licensed vessel of the United States,' a part of which time must have been during the 60 days immediately preceding his application for relief, shall entitle him to treatment. The phrase '60 days continuous service' shall not be held to exclude seamen whose papers show brief intermission between short services that aggregate the required 60 days, provided that such intermission does not exceed 60 days.

“ 367. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seamen

on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

"368. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the Public Health Service or marine hospital office or office of the customs officer when application is made for relief if relief is furnished.

"374. Whenever an applicant for relief presents himself at a Public Health Service or marine hospital office or at a custom-house without a master's certificate or shipping commissioner's discharge, and it is impracticable to obtain such certificate, the affirmation of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for the benefits of the service.

"378. When a seaman applies for relief after an absence of 60 days or more from his last vessel and it satisfactorily appears that it was impracticable for him to apply to the proper officer for treatment or that he obtained treatment at his own expense, a statement of the facts, together with a copy of the application and other papers in support of same, shall be filed and the seaman admitted to hospital.

"381. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment he must, to entitle him to treatment, furnish a new certificate of service showing that he is still following his vocation as seaman, or give satisfactory evidence that such service has been prevented by closure of navigation or by sickness, the latest dates of service, and, in case of lack of recent service, its explanation, to appear on his record card.

"385. Seamen who may be injured in street brawls or while committing a breach of the peace, and are, therefore, confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the service. Such seamen should, however, be furnished treatment if brought to service or contract hospital.

"386. Seamen taken sick or injured on board or ashore while actually employed on a documented vessel shall be entitled to treatment at relief stations without reference to the length of their service.

The United States Public Health Service maintains for the relief and hospitalization of seamen, hospitals and relief stations at the following ports, and any seamen entitled to relief under the above quoted regulations may obtain same by applying either at the hospital direct or at the out-patient office of the hospital.

Bangor, Me.	Beaufort, N. C.	Manitowoc, Wis.
Rockland, Me.	Elizabeth City, N. C.	La Crosse, Wis.
Bath, Me.	Edenton, N. C.	Ashland, Wis.
Machias, Me.	Washington, N. C.	Duluth, Minn.
Castine, Me.	Charleston, S. C.	Cincinnati, Ohio
Boothbay, Me.	Georgetown, S. C.	Gallipolis, Ohio
Portland, Me.	Beaufort, S. C.	Burlington, Iowa
Eastport, Me.	Paducah, Ky.	Evansville, Ind.
Ellsworth, Me.	Louisville, Ky.	St. Louis, Mo.
Portsmouth, N. H.	Nashville, Tenn.	Kansas City, Mo.
Boston, Mass.	Chattanooga, Tenn.	Little Rock, Ark.
New Bedford, Mass.	Memphis, Tenn.	Newport, Ark.
Nantucket, Mass.	Tampa, Fla.	Fort Stanton, N. M.
Salem, Mass.	Jacksonville, Fla.	El Paso, Tex.
Provincetown, Mass.	Key West, Fla.	Port Arthur, Tex.
Gloucester, Mass.	Fernandino, Fla.	Seattle, Wash.
Vineyard Haven, Mass.	Pensacola, Fla.	Port Townsend, Wash.
Barnstable, Mass.	Port Tampa, Fla.	Bellingham, Wash.
Newport, R. I.	Apalachicola, Fla.	Tacoma, Wash.
Providence, R. I.	Mobile, Ala.	Hoquiam, Wash.
New Haven, Conn.	Gulfport, Miss.	Port Angeles, Wash.
New London, Conn.	Pascagoula, Miss.	South Bend, Wash.
Bridgeport, Conn.	Natchez, Miss.	Portland, Ore.
Hartford, Conn.	Vicksburg, Miss.	Astoria, Ore.
New York, N. Y.	New Orleans, La.	Marshfield, Ore.
Oswego, N. Y.	Galveston, Tex.	Newport, Oregon
Stapleton, N. Y.	Buffalo, N. Y.	San Francisco, Cal.
Brooklyn, N. Y.	Cleveland, O.	Los Angeles, Cal.
Albany, N. Y.	Sandusky, O.	San Diego, Cal.
Ogdensburg, N. Y.	Toledo, O.	Eureka, Cal.
Newark, N. J.	Ashtabula, O.	San Pedro, Cal.
Perth Amboy, N. J.	Chicago, Ill.	San Juan, P. R.
Philadelphia, Pa.	Cairo, Ill.	Honolulu, H. I.
Erie, Pa.	Detroit, Mich.	St. Thomas, V. I.
Pittsburgh, Pa.	Manistee, Mich.	Manila, P. I.
Lewes, Del.	Escanaba, Mich.	Cuba, P. I.
Baltimore, Md.	Menominee, Mich.	Unalaska, Alaska
Crisfield, Md.	Marquette, Mich.	Nome, Alaska
Cambridge, Md.	Sault Ste. Marie, Mich.	Juneau, Alaska
Solomon, Md.	Grand Haven, Mich.	Cordova, Alaska
Washington, D. C.	Saginaw, Mich.	Valdez, Alaska
Norfolk, Va.	Port Huron, Mich.	Ketchikan, Alaska
Richmond, Va.	Ludington, Mich.	Petersburg, Alaska
Irrington, Va.	Hancock, Mich.	Seward, Alaska
Reedville, Va.	Bay City, Mich.	Wrangall, Alaska
Savannah, Ga.	Milwaukee, Wis.	Ancon, Balboa Heights,
Brunswick, Ga.	Green Bay, Wis.	C. Z.
Wilmington, N. C.	Sheboygan, Wis.	Ponce, Porto Rico
Newbern, N. C.	Superior, Wis.	

EXCERPTS FROM U. S. NAVIGATION LAWS, 1919

CREW ACCOMMODATIONS

Mar. 2, 1895. (a) The tonnage of the spaces or compartments occupied by or appropriated to the use of the crew of the vessel. Every place appropriated to the crew of the vessel shall have a space of not less than seventy-two cubic feet and not less than twelve superficial feet, measured on the deck or floor of that place for each seaman or apprentice lodged therein. The provisions of this Act requiring a crew space of seventy-two cubic feet per man shall apply only to vessels the construction of which shall be begun after June thirtieth, eighteen hundred and ninety-five. Such place shall be securely constructed, properly lighted, drained and ventilated, properly protected from weather and sea, and as far as practicable properly shut off and protected from the effluvium of cargo or bilge water; and failure to comply with this provision shall subject the owner to a penalty of five hundred dollars. Every place so occupied shall be kept free from goods or stores of any kind not being the personal property of the crew in use during the voyage; and if any such place is not so kept free the master shall forfeit and pay to each seaman or apprentice lodged in that place the sum of fifty cents a day for each day during which any goods or stores as aforesaid are kept or stored in the place after complaint has been made to him by any two or more of the seamen so lodged.

Mar. 3, 1897. On all merchant vessels of the United States the
Sec. 2. construction of which shall be begun after the passage
Mar. 4, 1915. of this Act, except yachts, pilot boats, or vessels of
Sec. 6. less than one hundred tons register, every place
(Effective beginning appropriated to the crew of the vessel shall have a
Nov. 4, 1915) space of not less than one hundred and twenty cubic feet and not less than sixteen square feet, measured

on the floor or deck of that place, for each seaman or apprentice lodged therein, and each seaman shall have a separate berth and not more than one berth shall be placed above another; such place or lodging shall be securely constructed, properly lighted, drained, heated and ventilated, properly protected from weather and sea, and, as far as practicable, properly shut off and protected from the effluvium of cargo or bilge water. And every such crew space shall be kept free from goods or stores not being the personal property of the crew occupying said place in use during the voyage.

That in addition to the space allotment for lodgings hereinbefore provided, on all merchant vessels of the United States which in the ordinary course of their trade make voyages of more than three days' duration between ports, and which carry a crew of twelve or more seamen, there shall be constructed a compartment suitably separated from other spaces, for hospital purposes, and such compartment shall have at least one bunk for every twelve seamen, constituting her crew, provided that not more than six bunks shall be required in any case.

All merchant vessels of the United States, the construction of which shall be begun after the passage of this act having more than ten men on deck must have at least one light, clean and properly ventilated washing place. There shall be provided at least one washing outfit for every two men of the watch. The washing place shall be properly heated. A separate washing place shall be provided for the fire-room and engine-room men, if their number exceed ten, which shall be large enough to accommodate at least one-sixth of them at the same time, and have hot and cold water supply and a sufficient number of wash basins, sinks, and shower baths.

Any failure to comply with this section shall subject the owner or owners of such vessel to a penalty of not less than \$50 nor more than \$500: Provided, that forecastles shall be fumigated at such intervals as may be provided by regulations to be issued by the Surgeon-General of the Public Health Service, with

the approval of the Department of Commerce, and shall have at least two exits, one of which may be used in emergencies.

LOG BOOK

R. S., 4290. Every vessel making voyages from a port in the United States to any foreign port, or being of the burden of seventy-five tons, or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an official log-book; and every master of such vessel shall make, or cause to be made therein, entries of the following matters, that is to say:

Fifth.—Every case of illness or injury happening to any member of the crew, with the nature thereof, and the medical treatment.

Sixth.—Every case of death happening on board, with the cause thereof.

WARMTH AND CLOTHING

R. S. 4572.
Dec. 21, 1898.
Sec. 15. Every vessel bound on any foreign voyage exceeding in length fourteen days shall also be provided with at least one suit of woolen clothing for each seaman, and every vessel in the foreign or domestic trade shall provide a safe and warm room for the use of seamen in cold weather. Failure to make such provision shall subject the owner or master to a penalty of not less than one hundred dollars. (This section shall not apply to fishing or whaling vessels or yachts. December 21, 1898, sec. 26.)

MEDICINES AND ANTISCORBUTICS

Every vessel belonging to a citizen of the United States, bound from a port in the United States to any foreign port, or being of the burden of seventy-five tons or upward, and bound from a port on the Atlantic to a port on the Pacific, or vice versa, shall be provided with a chest of medicines; and every sailing-vessel bound on a voyage across the Atlantic or Pacific Ocean, or around Cape Horn, or the Cape of Good Hope, or engaged in the whale or other fisheries or in sealing, shall also be provided with, and cause to be kept, a sufficient quantity of lime or lemon juice, and also sugar and vinegar, or other anti-scorbutics, to be served out to every seaman as follows: The master of every such vessel shall serve the lime or lemon juice, and sugar and vinegar, to the crew, within ten days after salt provisions continues; the lime or lemon juice and sugar daily at the rate of half an ounce each per day; and the vinegar weekly at the rate of half a pint for each member of the crew.

If, on any such vessel, such medicines, medical stores, lime or lemon juice, or other articles, sugar, and vinegar, as are required by the preceding section, are not provided and kept on board, as required the master or owner shall be liable to a penalty of not more than five hundred dollars; and if the master of any such vessel neglects to serve out the lime or lemon juice, and sugar and vinegar in the case and manner directed, he shall for each such offense be liable to a penalty of not more than one hundred dollars; and if any master is convicted in either of the offenses mentioned in this section, and it appears that the offense is owing to the act or default of the owner, such master may recover the amount of such penalty, and the costs incurred by him, from the owner.

SCALE OF PROVISIONS TO BE ALLOWED AND SERVED OUT TO CREW DURING THE VOYAGE

		Sun.	Mon.	Tues.	Wed.	Th'r	Fri.	Sat.
R. S. 4612, Dec. 21, 1898. Sec. 23, Mar. 4, 1915. Sec. 10.	Water.....qts.	5	5	5	5	5	5	5
	Biscuit.....lbs.	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
	Beef, salt.....lbs.			$1\frac{1}{4}$		$1\frac{1}{4}$		$1\frac{1}{4}$
	Pork, salt.....lbs.		1		1		1	
	Flour.....lbs.	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		
	Canned meat.....lbs.	1			1			
	Fresh bread.....lbs.	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
	Fish, dry, pres.							
	or fresh.....lbs.						1	
	Potatoes or yams.....lbs.	1	1	1	1	1	1	1
	Canned to-atoes.....lb.	$\frac{1}{2}$					$\frac{1}{2}$	
	Peas.....pt.			$\frac{1}{3}$			$\frac{1}{3}$	
	Beans.....pt.				$\frac{1}{3}$			
	Rice.....pt.		$\frac{1}{3}$					$\frac{1}{3}$
	Coffee (green berry).....oz.	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	Tea.....oz.	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
	Sugar.....oz.	3	3	3	3	3	3	3
	Molasses.....pt.	$\frac{1}{2}$		$\frac{1}{2}$		$\frac{1}{2}$		
	Dried fruit.....oz.	3		3		3		
	Pickles.....pt.		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
	Vinegar.....pt.			$\frac{1}{2}$				$\frac{1}{2}$
	Corn Meal.....oz.	4				4		
	Onions.....oz.	4				4		4
	Lard.....oz.	1	1	1	1	1	1	1
	Butter.....oz.	2	2	2	2	2	2	2
	Mustard, pepper and salt sufficient for seasoning.....							

SUBSTITUTES

One pound of flour daily may be substituted for the daily ration of biscuit or fresh bread; two ounces of desiccated vegetables for one pound of potatoes or yams; six ounces of hominy, oatmeal, or cracked wheat, or two ounces of tapioca, for six ounces of rice; six ounces of canned vegetables for one-half pound of canned tomatoes; one-eighth of an ounce of tea for three-fourths of an ounce of coffee; three-fourths of an ounce of coffee for one-eighth of an ounce of tea; six ounces of canned fruit for three ounces of dried fruit; one-half ounce of lime juice for the daily ration of vinegar; four ounces of oatmeal or cracked wheat for one-half pint of cornmeal; two ounces of pickled onions for four ounces of fresh onions.

When the vessel is in port and it is possible to obtain the same, one-and-one-half pounds of fresh meat shall be substituted for the daily rations of salt and canned meat; one-half pound of green cabbage for one ration of canned tomatoes; one-half pound of fresh fruit for one ration of dried fruit. Fresh fruit and vegetables shall be served while in port if obtainable. The seamen shall have the option of accepting the fare the master may provide, but the right at any time to demand the foregoing scale of provisions. The foregoing scale of provisions shall be inserted in every article of agreement, and shall not be reduced by any contract, except as above, and a copy of the same shall be posted in a conspicuous place in the galley and in the forecabin of each vessel. (Fishing or whaling vessels or yachts exempt—December 21, 1898, sec. 26.)

Sick and Disabled Seamen

The President is authorized to receive donations of real or personal property, in the name of the United States, for the erection or support of hospitals for sick and disabled seamen.

The term "seaman," wherever employed in legislation relating to the marine-hospital service, shall be held to include any person employed on board in the care, preservation, or navigation of any vessel, or in the service, on board, of those engaged in such care, preservation, or navigation.

No person employed in or connected with the navigation, management, or use of canal-boats engaged in the coasting-trade shall by reason thereof be entitled to any benefit or relief from the marine-hospital fund.

Sick and disabled seamen of foreign vessels and of vessels (not subject to hospital-dues) may be cared for by the marine-hospital service at such rates and under such regulations as the Secretary of the Treasury may prescribe.

Sick foreign seamen may be admitted to the marine hospitals within the United States, if it can with convenience be done, on the application of the master of any foreign vessel to which any such seaman may belong. Each seaman so admitted shall be subject to a charge of (seventy-five cents) per day for each day he may remain in the hospital, which shall be paid by the master of such foreign vessel to the collector of the collection-district in which such hospital is situated. And the collector shall not grant a clear-

ance to any foreign vessel until the money so due from her master shall be paid. The officer in charge of each hospital is hereby directed, under penalty of fifty dollars to make out the accounts against each foreign seaman that may be placed in the hospital under his direction, and render the same to the collector.

The following form, 1915, must be furnished by the master or authorized agent of vessel to a seaman desiring to make application to a relief station of the U. S. Public Health Service for examination or treatment. Blanks may be secured upon application to the nearest relief station.

TREASURY DEPARTMENT,
U. S. PUBLIC HEALTH SERVICE.
Form 1915
F. C., Nov. 4-16.

**MASTER'S CERTIFICATE OF SERVICE OF SICK
OR INJURED SEAMEN**

.....
(Place.)
....., 191

To whom it may concern:

I CERTIFY, on honor, that....., whose signature
and description appear below, has been employed on board in the care,
preservation, or navigation of the
(Name and class of vessel.)

.....of.....
(Home port, where permanent document issues.)

or in the service, on board, of those engaged in the care, preservation,
or navigation of said vessel, from the day of,
191 , to the..... day of, 191 . I,
further certify that the person named herein has, in my presence,
signed his name in the blank space provided below for that purpose.

.....
Master of the above-named vessel.

Signature of the person named above.....
Nativity....., age..... years, height.... feet....
inches, color of eyes....., color of hair....., distinguishing
marks:.....
.....
Previous service.....
.....
Total service on U. S. vessels years months.

INSTRUCTIONS

- 1. If the seaman is unable to write, his mark should be witnessed by the master or authorized agent of the vessel.
- 2. The medical officer, or attending physician, should compare the seaman's signature with that given in the certificate, as a means of identification.

NOTICE.—This certificate must be signed by the Master or Authorized Agent of the Vessel. Any person defrauding the United States by forging signatures or gaining admission to a hospital when not a seaman will be prosecuted and punished according to sections 5418, 5421, or 5438, Revised Statutes.

GLOSSARY

(Explanation of Medical Terms)

Abdomen.—Belly.

Abscess.—A local collection of pus.

Acute.—Sharp, sudden, usually severe. Not chronic.

Adhesive.—Sticking plaster of large size, used to hold dressings in place, and also wound edges together till healing takes place.

Amoeba.—Plural amoebae. Very small living parasites. Some cause disease.

Anatomy.—The science which deals with the structure of the body.

Anesthesia.—Loss of feeling.

General Anesthesia.—Sleep under ether or chloroform.

Local Anesthesia.—Production of loss of feeling in a part.

Anopheles.—A type of mosquito. (Carrier of malaria.)

Anthrax.—An acute, often fatal, infectious disease, due to the anthrax germ.

Antidote.—A remedy for counteracting a poison and stopping its action.

Antiscorbutic.—A substance, usually a food, used to prevent scurvy.

Antiseptic.—A substance which will prevent the growth of germs.

Artificial Respiration.—Artificial breathing.

Bladder.—The organ which holds urine, located in the belly.

Blood Clot.—Blood which, exposed to air, becomes solid.

Bowel.—(See Anatomy, Part II.) Intestine, gut.

Bubo.—Swollen glands.

Bubonic.—Having buboes or swellings of glands, as in groin.

Burrow.—To penetrate, to perforate, to force through.

Buttocks.—The rump; projections on which one sits.

Caffein.—A drug used as a heart stimulant.

Capillary.—A very fine blood vessel, too small to see.

Capsule.—A small case made of gelatin for holding drugs, like a pill.

- Cathartic.**—A substance which, when taken by mouth, causes a movement of the bowels.
- Caustic.**—A drug which burns and destroys soft tissues like skin.
- Cauterize.**—To burn.
- Centigrade Thermometer.**—One in which freezing temperature is 0 degrees, and boiling is 100 degrees.
- Charring.**—To burn black.
- Clinical (Record).**—Record of occurrences during illness.
- Clinical Thermometer.**—A thermometer used to take the temperature of a human being.
- Colic.**—Cramp-like pains, especially over the bowels.
- Collapse.**—Extreme prostration and depression with failure of the circulation.
- Comminute.**—Splintered, broken into small pieces.
- Commode.**—A box or seat and bucket into which stool or urine can be passed.
- Communicable Disease.**—One which can be communicated (given) from one person to another.
- Compress.**—A wad of gauze or cotton, dry or moist, applied over wounds or over pain.
- Confluent.**—Flowing together.
- Constipated.**—Condition in which the bowels do not move freely.
- Constitutional.**—Through the whole system.
- Contagious (disease).**—One that is spread by direct contact.
- Contamination.**—To become dirty by touching.
- Counter Irritant.**—A drug applied to the skin to produce redness.
- Cramps.**—Sharp pains which come and go, due to spasm of muscles.
- Crepitus.**—A grating sensation which can be felt when broken ends of bones are rubbed together.
- Cuddy.**—A small and closed space like a little room.
- Cyanide Gas.**—Also called hydrocyanic acid gas. A very poisonous gas used in disinfection.
- Delirium.**—Condition in which patient is said to be “out of his head.”
- Diagnosis.**—The act of distinguishing one disease from another.
- Digestion.**—The process of preparing food taken into the body for use by the body.
- Dilute.**—Not strong.
- Disinfectant.**—A substance which will kill disease germs.
- Disinfection.**—The destruction of germs.

Disinfestation.—Getting rid of vermin.

Dispensary.—Room or place where drugs are issued or where out-patients are treated.

Distended.—Filled—enlarged.

Distill.—To change a fluid into steam, by heat, and then again condense into pure fluid.

Douche.—The use of water or medicated water for cleansing wounds, or body cavities, applied with some force through a form of syringe.

Dutch Oven.—A shallow iron oven or pot in which sulphur is burned during fumigation.

Effluvium.—A foul smell given off from decaying matter, or other sources.

Elicit.—To bring forth.

Epidemic.—Condition in which there are a great many cases of a disease.

Epileptic.—A person who is subject to fits.

Eruption.—A “breaking out,” as on the skin or mucous membrane.

Excretion.—That which is thrown out of the system, like urine or sweat.

Extension.—To straighten out; to pull.

Fahrenheit Thermometer.—One in which freezing temperature is 32 degrees and boiling is 212 degrees.

Fever.—Greater temperature than normal.

Filter.—A device for straining water.

Fleeced.—Cheated.

Forceps.—An instrument with two blades for grasping and holding.

Fracture.—A break.

Fumigation.—The exposure to gases or fumes (usually with the idea of killing vermin and germs).

Gangrene.—Local death of a part.

Gauze.—A very thin cloth used for wound dressings.

Genital Organs.—Penis, scrotum, testicles, etc.

Germ.—A minute living particle. Some of them when grown in the body cause disease.

Glands.—Organs of various kinds. Lymph glands are small bodies in groins, armpits and elsewhere, which swell when infected.

Groin.—The fold between the body and the thigh. One on each side.

Hemorrhage.—To bleed.

Humerus.—The bone which extends from shoulder to elbow.

Hydrocyanic Gas.—See Cyanide Gas.

Hygiene.—The science of health and its preservation.

Hypodermic.—Under the skin.

Immerse.—To dip entirely, as in water.

Incise.—To cut.

Incubation period.—The time it takes a disease to develop after exposure to it.

Infected.—Containing the germs of disease.

Infection.—The growth of germs usually with the formation of pus.

Infectious (disease).—A disease caused by parasites such as germs.
A disease which may be carried from one to another.

Infested.—With vermin. The presence of vermin on a person or in a place.

Injunctions.—Urgent instructions.

Isolate.—To separate. To place alone.

Jaundice.—Yellowness of skin and eyes.

Kidneys.—Two glands which form urine, one on each side in the belly.

Laceration.—A tear. (A torn wound.)

Larvae (mosquito).—The young of mosquitoes (wigglers).

Lavatory.—A place for washing.

Ligaments.—Tough fibrous bands connecting bones or supporting soft tissues.

Ligate.—To tie off, as a blood vessel.

Ligature.—A thread for tying a vessel.

Manipulate.—To work with the hands; to move.

Mucous Membrane.—The reddish lining of all body cavities which communicate with the air, as the mouth.

Nausea.—"Sick at stomach." Desire to vomit.

Neutralize.—To make neutral or inactive as by adding an acid to an alkali.

Nits.—The eggs of lice, very small white, roundish bodies.

Oozing.—Very slowly flowing.

- Paraffined.**—Dipped into or coated with a paraffine, a sort of wax, which melts with heat.
- Pernicious.**—Very injurious, likely to hurt or kill.
- Petroleum.**—Crude oil as it comes from the well.
- Physiology.**—The science that deals with the functioning of the different parts of the body.
- Plague.**—Bubonic plague. An epidemic and highly fatal disease due to a germ.
- Pockmark.**—The mark or scar left on the skin from a previous attack of smallpox.
- Pox.**—A term used to designate small pox or syphilis (great pox).
- Pratique.**—Permission given to a ship that has satisfied the Health Regulations to hold intercourse with a port.
- Prevalence.**—To be present and extend widely.
- Primary.**—First.
- Purgation.**—The process of purging. Causing free bowel movement.
- Purgative.**—A medicine which causes the bowels to move.
- Pustule.**—A pimple of large size which contains pus.
- Putrify.**—To rot.
- Pyorrhea.**—A condition in which the gums shrink and the roots of the teeth are exposed with the formation of pus along the gum line.
- Quack.**—A man who makes false claims of medical skill or knowledge.
- Radius.**—One of the bones of the forearm, extending from elbow to wrist.
- Rectal.**—Pertaining to the rectum, which is the last few inches of the intestine ending in the anus, or outlet of the bowel.
- Rectum.**—The lower end of the gut through which the stool is expelled.
- Relax.**—To make loose, slacken.
- Restoration.**—To bring back.
- Retention of Urine.**—Condition in which the urine remains in the bladder and can not be forced out.
- Rupture.**—To break through.
- Saliva.**—Spit (spittle).
- Sanitary.**—In accord with health, healthful.
- Sanitation.**—The establishment of conditions favorable to health.
- Septicemic.**—Relating to septicemia or blood poisoning.

Serum.—The fluid part of the blood, in which the blood corpuscles float.

Shamming.—Pretending, faking.

Sloughing.—The separation of dead tissues from the living, when destruction of tissues takes place, as after a crushing injury.

Smearing.—Spreading out in a thin layer.

Solution.—The state of being dissolved, as salt in water.

Sputum.—What is spit up from the mouth, throat, or lungs.

Status.—State or condition.

Stegomyia Fasciata.—A kind of mosquito which carries yellow fever.

Sterile.—Free of all germ life.

Sterilization.—The process of killing all germs.

Still.—The apparatus by means of which distillation is carried on.

Stimulate.—To produce activity or quicken and strengthen action, as of the heart.

Stools.—Material passed from the bowel.

Strangulated.—Condition in which a part is pinched or constricted.

Sulphur Dioxide.—Gas produced by burning sulphur.

Suspensory.—Suspensory bandage, an appliance used for supporting the testicles, made of webbing and similar material.

Suture.—Substance used for sewing.

Swab.—Cotton, gauze, cloth or similar material used for applying medicines locally or cleaning out wounds or cavities.

Symptoms.—The signs of a disease.

Temperature.—The degree of heat.

Testicles.—The two sexual glands which hang in a bag of skin under the penis.

Tissue.—A general term applied to all parts of the body. Almost any part may be called a tissue. For example the muscles, skin, glands, bones, etc. Soft tissues are the soft parts, bony tissues are the hard parts.

Torniquet.—An appliance for compressing a blood vessel, to prevent bleeding.

Ulcer.—A local open sore.

Ulna.—One of the bones extending from elbow to wrist.

Urethra.—The water passage through the penis from the bladder.

Vaccination.—The prevention of disease by injecting the germs of that disease locally.

Vaccine.—The substance used in vaccination to protect against a disease.

Venous.—Relating to veins.

Venereal Disease.—A disease contracted during sexual intercourse.

Ventilation.—The process of continually supplying fresh air.

Vermin.—Animal parasites. Rats, mice, lice, bedbugs, fleas, etc.
Many of them carry disease.

Vitality.—Life.

Yucca.—A tree from which wood for light splints is sometimes obtained.

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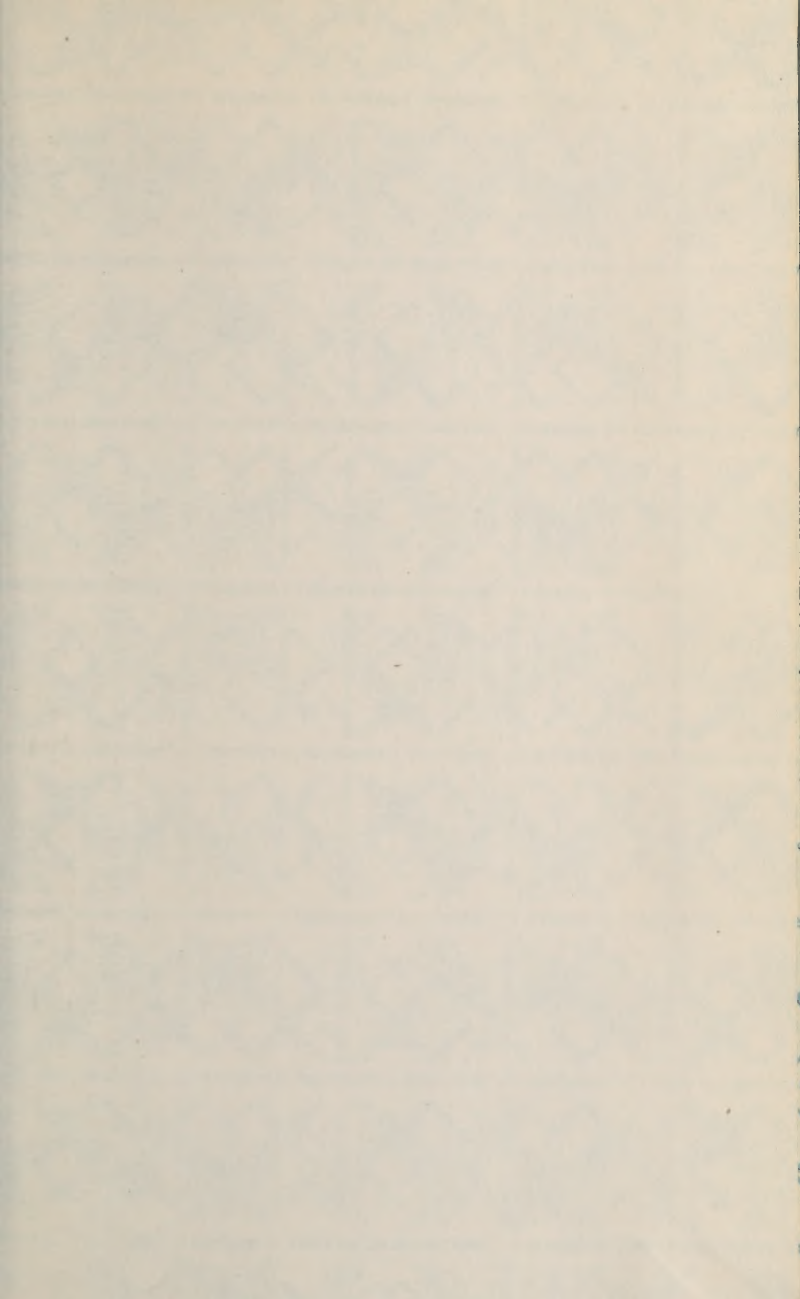
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